FLIGHT

MAY 1958
50 cents

TECHNOLOGY DEPT.

MAGAZINE

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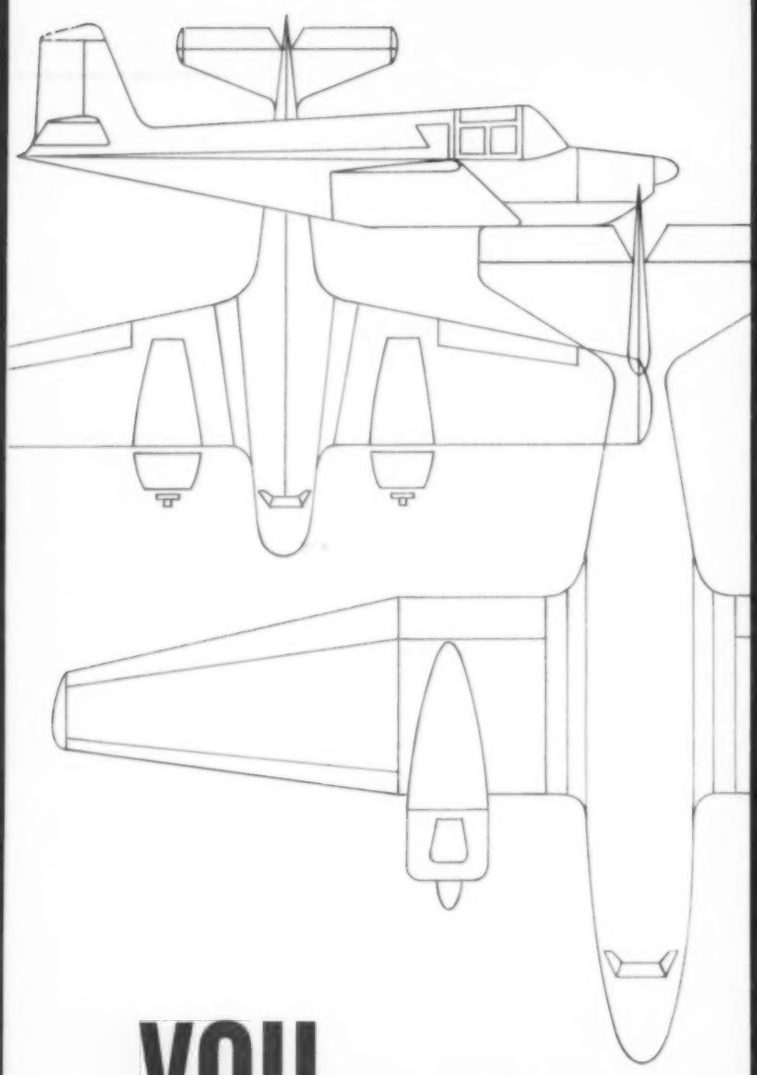
MAY 19 1958
DETROIT

BEECHCRAFT TRAVEL AIRS

See page 28



now YOU can own the finest radio equipment in the world

Among men who know radio, the Collins reputation for the highest standards is universally known. Professional pilots with airline and military flying experience associate quality and performance with the Collins trademark. Now, from this leader in airborne radio come the finest systems in business aviation, tailored to your aircraft type. Collins is appointing nearly 200 distributors to serve your radio needs — whether with a new communication transmitter or a complete new Collins system. Check the radio services offered in the adjoining table and see your Collins distributor for price information.

COLLINS

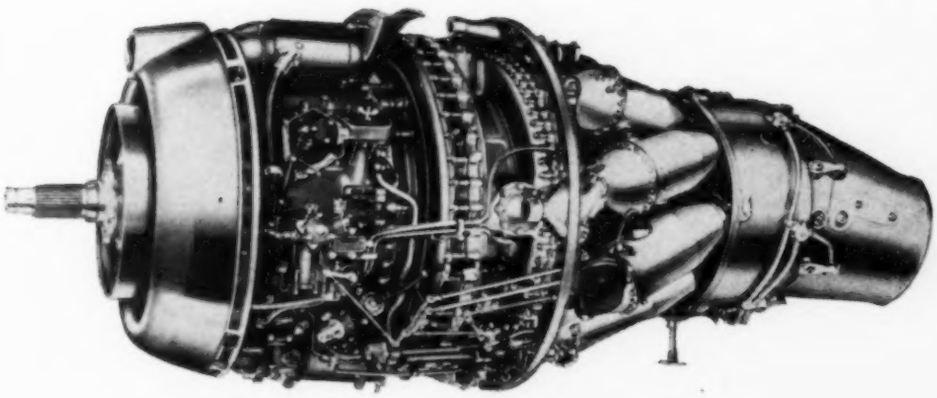
SINGLE ENGINE SYSTEM	Type Number	Weigh Pound
COMM		
VHF Receiver, 190 crystal-controlled channels	51X-3	3.25
VHF Transmitter, 90 crystal-controlled channels, 3 watts	17L-8	2.5
Power Supply	427B-2	5.0
NAV		
VOR/LOC Receiver	51X-3	3.2
Power Supply	427B-2	5.0
Omni-Converter-Indicator	344D-1	2.4
ILS		
1-light Marker Beacon Receiver	51Z-2A	4.9
TOTAL WEIGHT		26.3
This system uses only 8.05 amps of 13.5 vdc		

LIGHT TWIN-ENGINE SYSTEM	Type Number	Weight Pounds
COMM		
VHF Receiver, 880 crystal-controlled channels	51X-2	10.5
VHF Transmitter, 680 crystal-controlled channels, 25 watts	17L-7	14.0
STANDBY COMM		
VHF Transmitter, 90 crystal-controlled channels, 3 watts	17L-8	2.5
NAV I		
VOR/LOC Receiver	51X-2	10.5
Omni-Converter	344B-1	14.0
RMI dual pointer (ADF & 344B-1)	332C-1	2.0
FLIGHT DIRECTOR		
Computer, gyro and instruments	FD-104	28.5
NAV II		
VOR/LOC Receiver	51X-3	3.25
Power Supply	427B-1	5.0
Omni-Converter	344A-1	9.0
Course Selector Indicator	331H-1	2.0
ADF		
Automatic Direction Finder (includes antenna, receiver, control)	DF-201	30.0
COMPASS		
Gyro compass, including gyro, flux detector, amplifier and slave indicator	MC-102	14.3
ILS		
10-channel Glideslope Receiver	51V-3	6.4
3-light Marker Beacon Receiver	51Z-2	4.9
TOTAL WEIGHT		156.85
This system uses only 10.86 amps of 27.5 vdc		

HEAVY TWIN-ENGINE SYSTEM	Type Number	Weight Pounds
COMM		
VHF Receiver, 880 crystal-controlled channels	51X-2	10.5
VHF Transmitter, 680 crystal-controlled channels, 25 watts	17L-7	14.0
STANDBY COMM		
VHF Transmitter, 680 crystal-controlled channels	17L-7	14.0
NAV I		
VOR/LOC Receiver	51X-2	10.5
Omni-Converter, Servo Amp, OBI	344B-1	13.0
RMI dual pointer (ADF & 344B-1)	332C-1	2.0
NAV II		
VOR/LOC Receiver	51X-2	10.5
Omni-Converter, Servo Amp, OBI	344A-1	9.0
Course Selector Indicator	331H-1	2.0
ADF		
Automatic Direction Finder (includes antenna, receiver, control)	DF-201	30.0
ILS		
10-channel Glideslope Receiver	51V-3	6.4
3-light Marker Beacon Receiver	51Z-2	4.9
COMPASS		
Gyro Compass including, gyro, flux detector, amplifier and slave indicator	MC-102	14.3
AUTOPILOT		
AUTOMATIC PILOT including FLIGHT DIRECTOR, controls, instruments, servo controls, vertical gyro, computer and computer amplifier	AP-101 FD-104	130.0
PA SYSTEM		
Passenger Address Amplifier	346D-1	9.6
INTERPHONE		
Interphone Amplifier	346A-1	6.0
RADAR		
Including indicator, control, synchronizer, RT unit and antenna	WP-101	122.8
TOTAL WEIGHT		409.5

ROLLS-ROYCE
DART
PROP-JETS

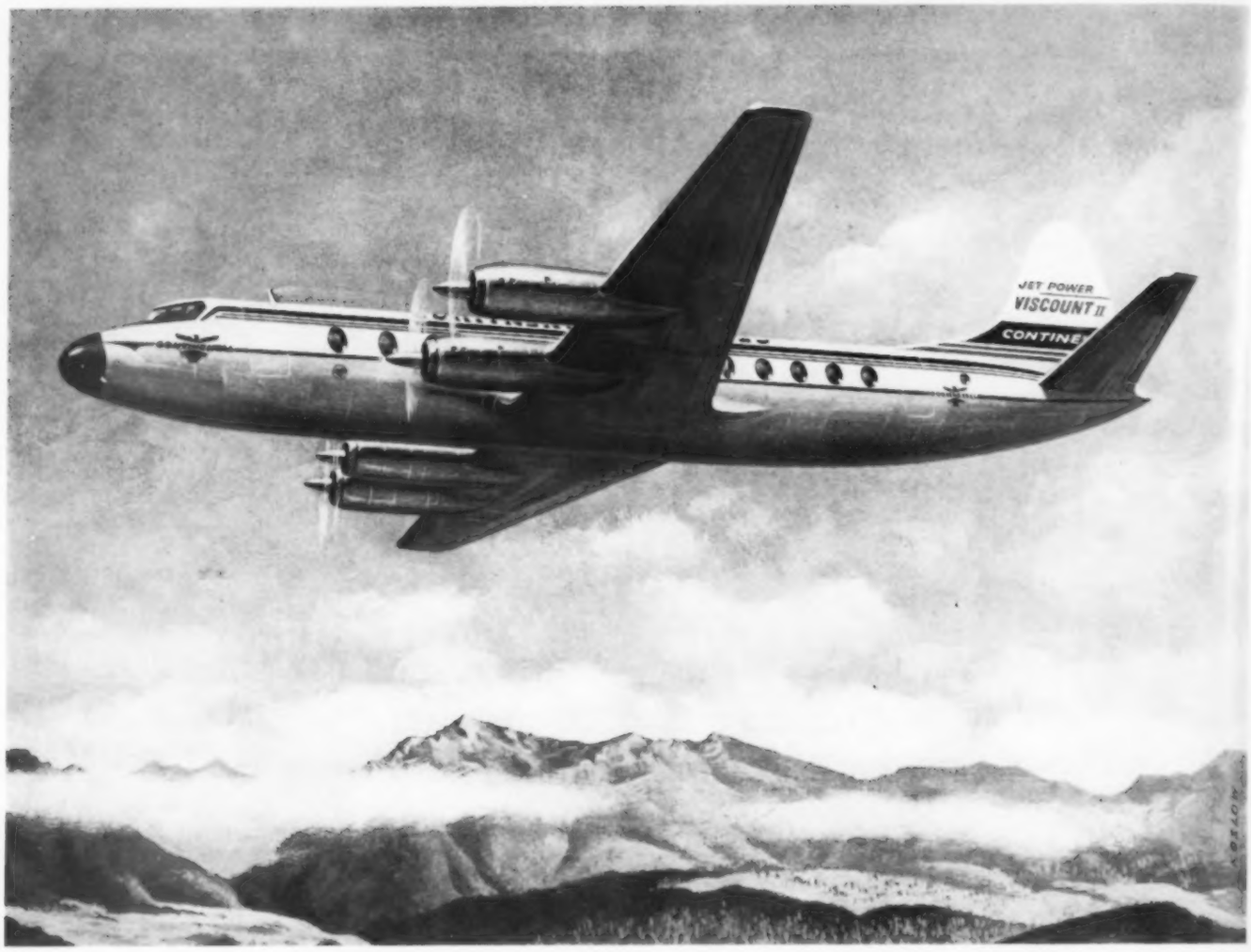
POWER THE VICKERS VISCOUNT, THE FAIRCHILD F-27 AND THE AVIATION TRADERS ACCOUNTANT AND HAVE BEEN CHOSEN FOR THE ARMSTRONG WHITWORTH 650 FREIGHTERCOACH THE HANDLEY PAGE HERALD AND THE GRUMMAN GULFSTREAM



For airline, local service carrier and executive operation, the Rolls-Royce Dart is the most proven prop-jet in the world. It has flown over 4,000,000 hours in scheduled airline service.

ROLLS-ROYCE LIMITED, DERBY, ENGLAND.

AERO ENGINES . MOTOR CARS . DIESEL AND GASOLINE ENGINES . ROCKET MOTORS . NUCLEAR PROPULSION



New Air Service for the West—

THE CONTINENTAL VISCOUNT II

Continental Air Lines – a user of Phillips 66 Aviation Fuels – announces a new, faster service for air travelers with its Continental Jet Power Viscount II. Powered with four Rolls Royce RDA 7 engines capable of 2100 horsepower each, these aircraft cruise at speeds up to 365 miles an hour. At a later date, Rolls Royce Dart RDA 11 engines of 2500 horsepower each will be installed in the Viscount fleet, and the planes will then cruise at 400 miles per hour.

The Viscount II carries 52 passengers, first class, in twin rows of seats. In addition, there is a pleasant lounge accommodating four people.

● Today, Phillips 66 Aviation Fuels give dependable, efficient performance to Continental and other leading air lines, as well as to the military air services.

In step with the future, Phillips is a leading producer of *super performance* Jet Fuels for the latest designs in turbo-props and jets. And Phillips research continues to lead the way for development of fuels for the aircraft of tomorrow.

AVIATION DIVISION • PHILLIPS PETROLEUM COMPANY • BARTLESVILLE, OKLAHOMA

AIR Report
Significant Trends and News

PIPER AIRCRAFT WILL SOON OFFER A TRANSISTORIZED LATERAL STABILIZER, or single-axis control, which will maintain an airplane's heading or make desired turns automatically, as standard equipment on "super custom" versions of its single-engine Comanche and Tri-Pacer and its twin-engine Apache. The device will probably add only about $750 to the cost of the airplane and will be manufactured for Piper by Mitchell Industries of Mineral Wells, Texas, which will produce 5 a day for six months under present arrangements. It will weigh 4.5 lbs. or less and will be known as the AKO-64 for the Tri-Pacer, AKO-65 for the Apache and AKO-66 for the Comanche. . . . Mitchell has just increased its production of transistorized autopilots for the fourth time since Jan. 1 and is going to an output rate of 3 a day and has obtained CAA approval for this unit on the Cessna 310. Approval is pending for its use on the B-50 Twin-Bonanza and Mooney Mark 20, with Mooney Aircraft having ordered 10 units for factory installation.

LOOK FOR AERO DESIGN TO ADD A NEW MODEL 500 COMMANDER to its line, featuring direct-drive 250-hp. Lycomings and a lower price than other Commanders, with announcement of a new 7,500-lb. gross weight for its new wide-wing versions of the 680E Super Commander and pressurized Alti-Cruiser, formerly of 7,000 lbs. gross. The 500-lb. increase gives the 680E Super a 3,025-lb. useful load, highest of any light twin. The new 205-mph. Model 500 will be priced competitively with the Cessna 310B.

AERO DESIGN & ENGINEERING CO., which manufactures the Aero Commander, became a subsidiary last month of Rockwell-Standard Corp., Pittsburgh, which obtained 82% of the Oklahoma City firm's stock in negotiations with George Pew, principal stockholder. Pew will continue to head Aero Design as president and general manager of the subsidiary. Rockwell-Standard recently changed its name from Rockwell Spring and Axle Co. More intensive research and development for advanced business plane designs at Aero may be expected to result from the change in control and availability of greater financial resources. It is known that Aero Design has been engaged in jet and turboprop studies for some time.

MORE TIME HAS BEEN GRANTED BY CAB FOR COMMENT on Civil Air Regulations Draft Release 58-[illegible] proposing more skill requirements, including some instrument training, for private and commercial pilot certificates. The former deadline of April 18 for comment from interested persons has been extended to July 15. Announcement of the extension explained interested persons need more time to explore "certain aspects" with the industry such as the availability of flight instructors, instrument-equipped trainer aircraft and costs of such equipment.

CORPORATE PURCHASERS OF JET AND TURBINE AIRCRAFT would be discriminated against by a new proposed civil air regulation by CAB which would permit crew training and operational testing of multi-engine turbine-powered aircraft only by the airlines, according to Joseph B. Burns, president of the National Business Aircraft Association. Burns has asked CAB to permit business aircraft owners the same advantages as the airlines would receive.

CESSNA AIRCRAFT DELIVERED 330 NEW PLANES during April, bringing its total deliveries for the

(Continued on page 9)

FLIGHT MAGAZINE

MAY, 1958 VOL. 47, No. 5

THIS MONTH'S COVER shows new 4-place, 200-mph. twin-engine Travel Airs awaiting delivery at the Beech Aircraft Corporation factory. The first 40 Travel Airs went to distributors but customers who ordered theirs early are now receiving Travel Airs in all sections of the country.
—(Beech Photo by Jim Yarnell.)

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GEORGE E. HADDAWAY, Editor-Publisher; TOM ASHLEY, Managing Editor; FRED N. STONES, JR., Business Manager; LOUISE ROBERTSON, Circulation; E. H. PICKERING, Consultant; P. O. Box 750 (2700 N. Haskell Ave.), Dallas, Texas — Telephone TAylor 3-6191.

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Vought Vocabulary

read′i·ness: *when a fighter as new as tomorrow is in service with the Fleet today*

There's a bright, new glint to our Fleet today.

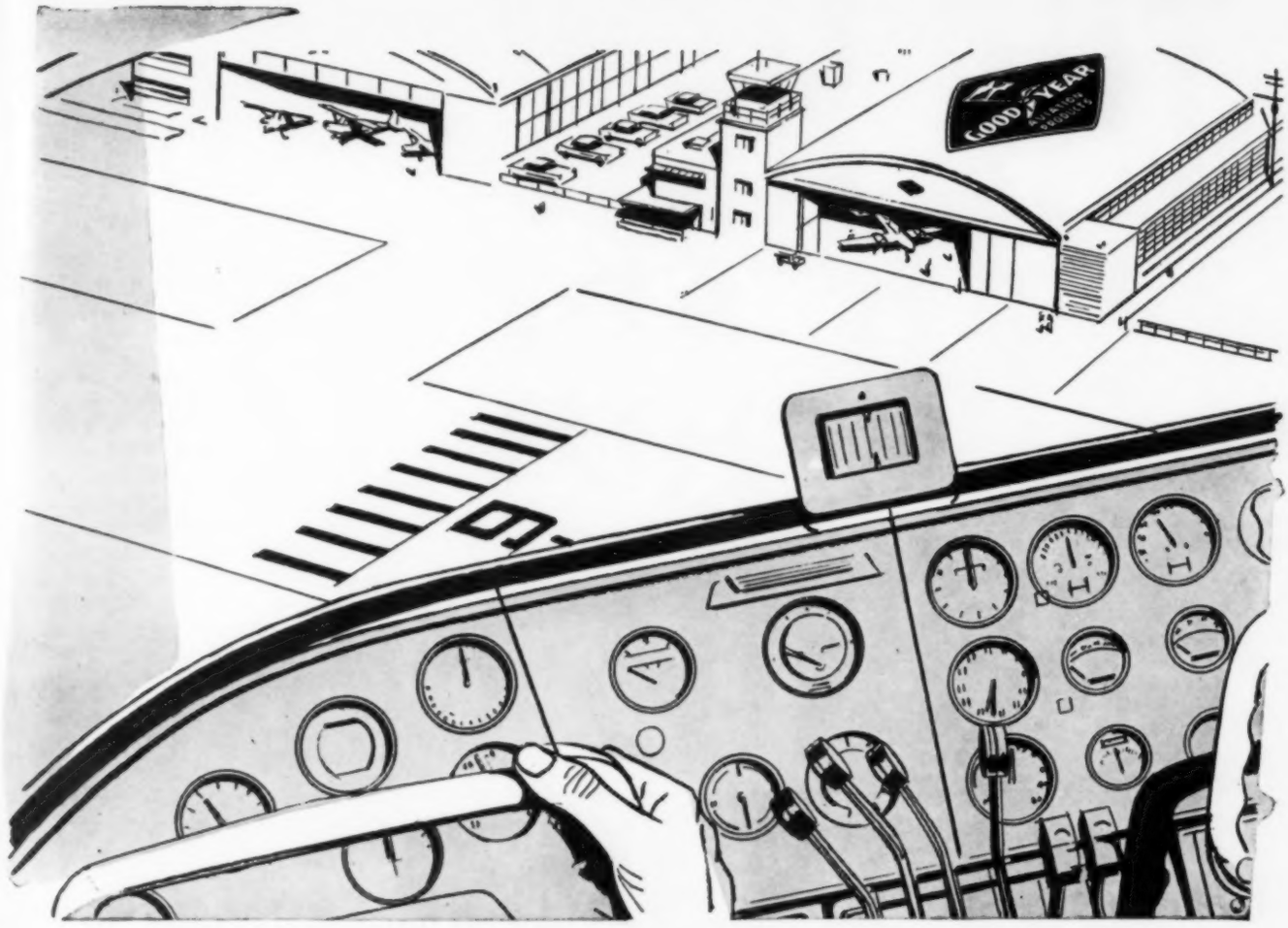
Chance Vought's 1,000-plus-mph *Crusader* has arrived – in strength! This potent fighter was designed a champion – in speed, ceiling and firepower. It was engineered, too, for swift production and for smooth introduction to pilots.

This sped the *Crusader* to duty faster than any modern jet. It brought to the Fleet in an age of peril *a weapon that will hold its edge.*

With the *Crusader* comes a new realm of four-figure speeds. Already, Navy and Marine pilots have used its performance to smash major world's records. Their unprecedented supersonic and carrier-to-carrier crossings of the U. S. signal a new chapter in manned aircraft speed and mobility.

Today, squadrons of *Crusaders* sweep the skies above the seas. Their trophy-winning performance adds unmatched combat strength to America's power for peace.

CHANCE VOUGHT AIRCRAFT
INCORPORATED · DALLAS, TEXAS



Green light for dependable service

The "green light"–your landing clearance–is always a welcome sign.

And there's another welcome sign here, too–the Goodyear "Sign of Service."

For at home or away, you have learned from experience that the man who displays this sign is dedicated to serving well your aviation needs–large or small–private or commercial.

It means that here you will find the highest quality aviation products – not only tires, tubes, wheels and brakes–but also a wide variety of other original equipment parts and accessories for the nation's vast fleet of private, business and executive aircraft.

It means that here you will find, at reasonable cost, prompt, efficient and courteous service backed by a time-proved reputation.

Wherever you fly, look for this sign–the Goodyear "Sign of Service"–your "green light" for dependable service.

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AVIATION
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PIEDMONT AVIATION, INC.
Winston-Salem, N. C.–Norfolk, Va.

VAN DUSEN AIRCRAFT SUPPLIES *Minneapolis, Minn.*
East Boston, Mass.–Miami, Fla.–Teterboro, N. J.
Chicago, Ill.–Richmond, Va.–Alexandria, Va.

GENERAL AVIATION SUPPLY COMPANY *Houston, Tex.*
Phoenix, Ariz.–Dallas, Tex.–Oklahoma City, Okla.
St. Louis, Mo.

SKY SUPPLY *P.O. Box 873, Helena, Mont.*

STANDARD PRODUCTS, INC. *Wichita, Kans.*
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DENVER AIRPLANE SUPPLY
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THE DON HORN COMPANY
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ATLANTIC AVIATION SERVICE, INC.
Box 1709, Wilmington, Delaware

STANDARD AIRCRAFT EQUIPMENT COMPANY, INC.
P.O. Box 271, Mineola, Long Island, N. Y.

THE NEW LEAR ADF-12*

CANNOT BE OUT-PERFORMED BY ANY ADF AT ANY PRICE!

*LIGHTEST IN WEIGHT—17.3 LBS.

PLUS—*provides power and modulation to drive your extra VHF transmitt*

Lightest weight!
Easiest to operate!
Lowest priced!

AND NOW—the Lear ADF-12E-2 with new etched amplifier circuitry and hermetically sealed transformers—has even *greater* reliability and performance.

Most compact, lightweight, inexpensive COMBINATION ADF SYSTEM:

1—Tuning range 190 to 1750 kc in 3 bands with continuous tuning—no frequency gaps.

2—Only ADF with loudspeaker output. 3 watts of audio.

3—Terrific ADF performance—plus communication and range navigation.

4—LEAR EXCLUSIVE—provides modulator power supply for VHF transmitter.

Double your safety with a DUAL Lear ADF-12E-2 at less cost than average single installations.

MODEL ADF-12E-2 TUNER

ADF-12E-2 TUNER: Easy to install. No flexible tuning shafts—direct drive. Easy to read the dial from any position. Press to test button. Improved sensitivity and selectivity. Highest signal to noise ratio.

AMPLIFIER: BRAND NEW ultra clean etched circuitry. Unmatched ADF reliability with hermetically sealed transformers—smallest size and lightest weight. Provides modulator power supply for VHF transmitter—an EXCLUSIVE Lear feature. C.W. optional on Model E-3. Superior tone quality and high power output. Extra long life power supply. Mounts vertically or horizontally.

FERRO-DYNAMIC® LOOP. Hermetically sealed—A.C. motor drive. Lear originated Ferro-Dynamic core. Small size, light weight—easy to install. Superior quadrantal error correction electrically—no cams. Highest loop gain of any ADF.

AZIMUTH INDICATOR: Electrically driven—no flex shafts. Simplified installation. Smoother response—greater accuracy. **Dual** azimuth indicator available for dual installations.

OPTIONAL MOUNTING: Shockmounts available for optional amplifier mounting—vertical or horizontal.

POWER OUTPUT: 3 watts max.; 1.2 watts undistorted.
POWER USE: Max. 3.3 amps. at 28 v.; 5.7 amps. at 14 v.
WEIGHT: Tuner, amplifier, loop, indicator—total 17.3 lbs.
TUNER: Length 8⅜"; width 6⅜"; height 2⅞".
AMPLIFIER: Length 12½"; width 7⅝"; height 6⅛".

See your Lear dealer or write to LearCal Division: Dept. F, 3171 South Bundy Drive, Santa Monica, Calif.

LEAR

LC-48

AIR REPORT

(Continued from page 5)

first four months of 1958 to about 1,000 new planes.

BEECH COMMERCIAL AIRCRAFT SALES for the first six months of the company's 1958 fiscal year totaled $16.8 million, a new record high, as compared to $16.1 million for the same 1957 period. The firm's total sales for the 1958 period were $49 million, with net earnings, after taxes, of $1.6 million.

PIPER AIRCRAFT SALES for the first six months of its 1958 fiscal year totaled $12.4 million as compared to $14.4 for the same 1957 period, with $975,216 in net earnings, after taxes, for the six months ended March 31, 1958. Piper expects greater sales and profits during the next six months because of lower Comanche production costs and more delivery volume for that new 4-place all-metal model.

FIRST OCEAN-CROSSING PIPER COMANCHE was ferried to Europe last month by Ray Davidson, Miami ferry pilot, accompanied by a twin-engine Piper Apache flown by Sydney Gilman, another Miami ferry pilot. Both the 4-place Comanche and the Apache flew Miami to Bermuda, Bermuda to the Azores and thence to Lisbon, longest leg being 2,100 miles between Bermuda and the Azores. The Comanche carried 206 gals. of fuel for a 3,700-mi. still-air range.

NARCO RADIO SALES ARE AHEAD OF LAST YEAR with the firm's backlog continuing to climb, employment increasing and many workers on an over-time basis. J. M. Riddle, Jr., president, reports directors recently voted a 5-to-1 common stock split.

HELICOPTER SUBCRIPTION AIR LIFT SERVICE for business firms has been inaugurated in Houston with two Bell 47H helicopters by a new firm, Helicopter Air Lift of Texas, owned by M & K Investment, Inc., which also has purchased from Skymotive, Inc., Helicopter Air Lift of Illinois, which operates 7 Bells in Chicago and pioneered the service. Ken C. Withers is president of M & K. Hal C. Conners, who conceived the idea in Chicago and developed it into an impressive business, remains as general manager in Chicago. The firm sells local copter charter service on a subscription basis at rates starting at $65 per hour for blocks of 25, 50 or 100 hours per year. The Houston headquarters are at 8233 Garfield at the Humble Oil Bulk Terminal near the Turning Basin.

LEAR IS DEVELOPING A REMOTE CONTROL SYSTEM FOR HELICOPTERS on a contract from Gyrodyne Company of America for its XRON-1 Rotorcycle, a one-man copter which could thus be radio-controlled from the ground. Flight tests will be at Lear's Grand Rapids plant.

BENNETT H. GRIFFIN, recently retired as director of Washington National Airport, is now associated as special aviation consultant with Howard, Needles, Tammen and Bergendoff, consulting engineers, and makes his headquarters in the firm's office at Miami International Airport, Miami, Florida.

ARMY INTEREST IN TWIN-TURBINE-SINGLE-PROPELLER AIRCRAFT has been revealed with completion of a 50-hr. preliminary flight rating test of the new 1,650-hp. Lycoming T55 turbine, which weighs

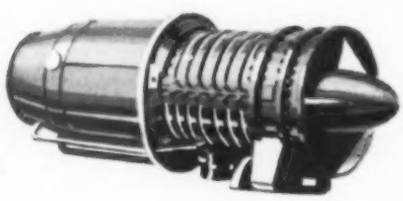
(Continued on page 59)

TWIN-BONANZA FOR KING HUSSEIN OF JORDAN, at left in photo, was 7,000th airplane delivered by Ferry Service Co., Inc., of Wichita and Lock Haven. Bobby Mayo, chief pilot of Ferry Service, delivered the Beech to the Jordan ruler at Amman, hurrying back to the U. S. with Co-Pilot Jack Bachman for another overseas delivery — this time an Aero Commander headed for Iran. Ferry Service is now world's largest company of its kind.

ACROSS THE U.S. AT 557 mph...

Answering the need for a much faster transport for military and business use, Lockheed's new Jetstar with Curtiss-Wright turbojet engines recently set a new unofficial record by spanning the continent from California to Georgia in 3 hours and 29 minutes. The Jetstar cut more than 1¾ hours from the former transport mark, averaging 557 miles per hour and reaching a top speed of 572 miles per hour. In test flights, the Jetstar has flown over 630 miles per hour.

Curtiss-Wright TJ-37 turbojet engines . . . . product of the cooperative engineering of Curtiss-Wright and Bristol Aero-Engines, Ltd., of Great Britain . . . have a thrust-weight ratio of 4.9 . . . the highest thrust-weight ratio for any current turbojet engine in service today. The TJ-37 is typical of the Curtiss-Wright program that seeks to bring to the United States *better* products *faster,* through reciprocal engineering agreements with leading companies in other countries of the Free World.



WRIGHT AERONAUTICAL DIVISION

CURTISS-WRIGHT

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CHECKLIST OF SPARTAN AVIATION SERVICES

INSTRUMENTS
overhaul, recalibration

RADIO REPAIR & RADAR
installation, revision to latest standards

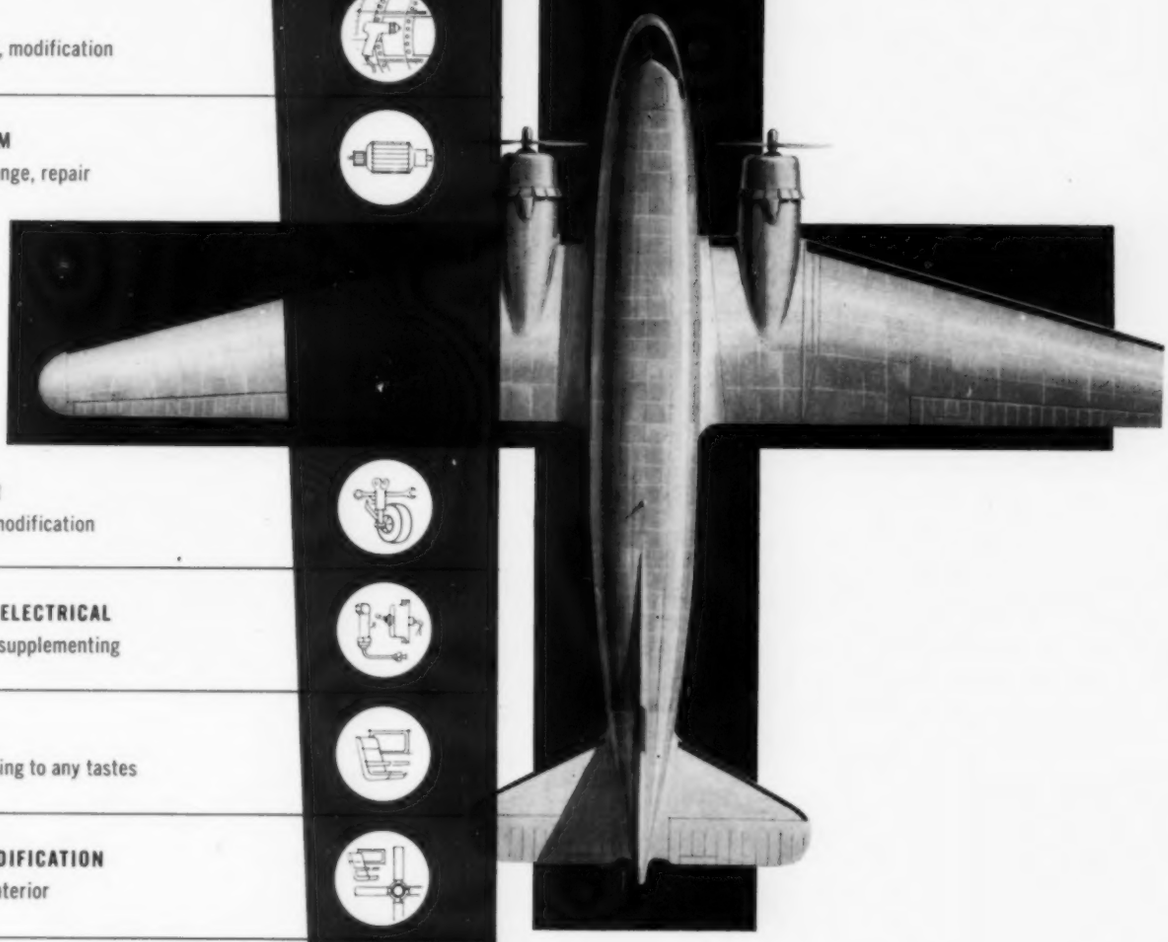
FUEL TANK
installation and sealing

ENGINE
repair, overhaul, testing

EXTERIOR PAINTING
for protection, smart style

AIR FRAME
repair, overhaul, modification

POWER SYSTEM
installation, change, repair



LANDING GEAR
testing, repair, modification

HYDRAULIC & ELECTRICAL
repair, revision, supplementing

INTERIOR
redesigning, styling to any tastes

COMPLETE MODIFICATION
from engine to interior

to schedule your plane for complete one-stop service, call, wire or write today.

SPARTAN
aircraft company aviation service division
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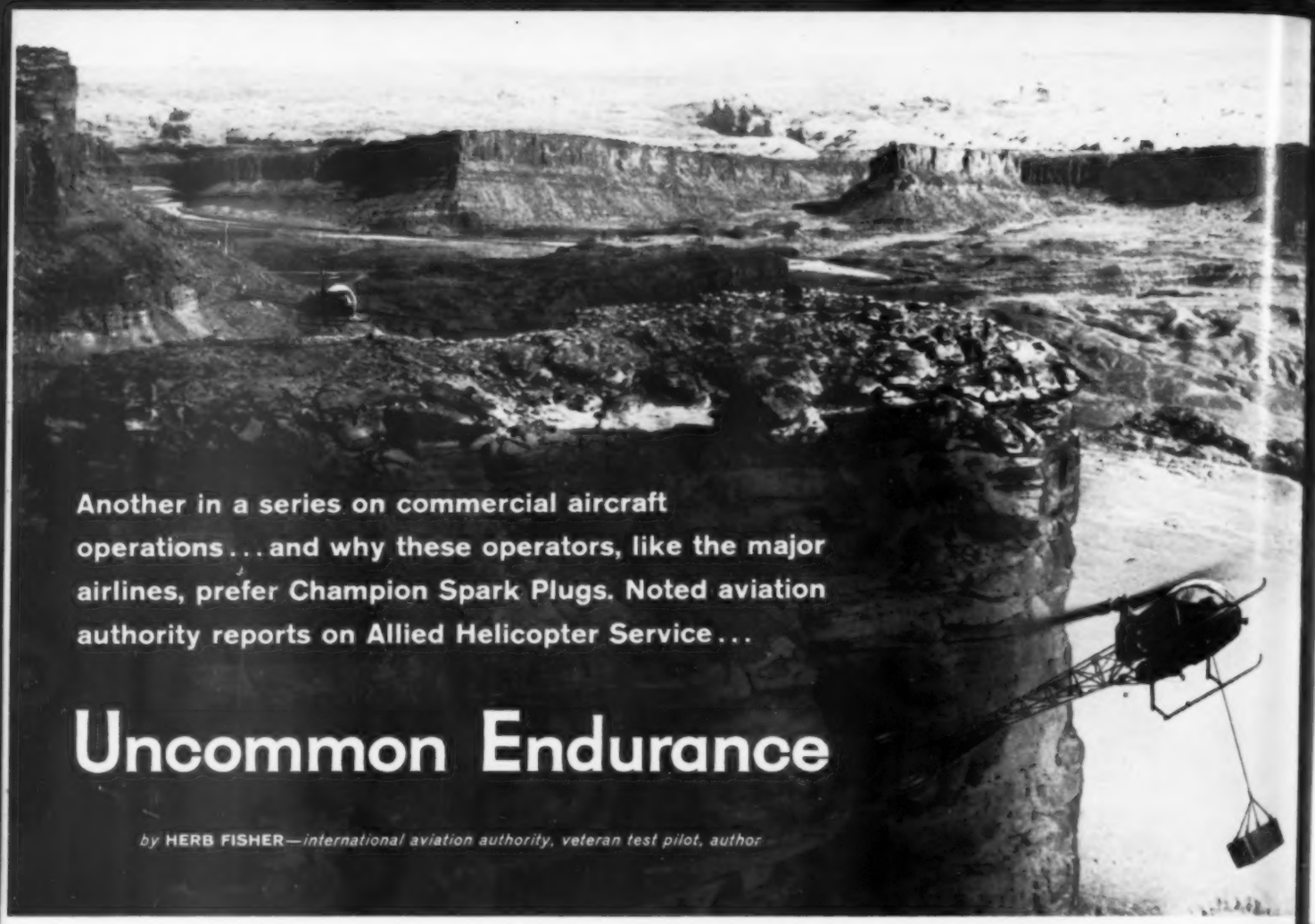


Another in a series on commercial aircraft operations . . . and why these operators, like the major airlines, prefer Champion Spark Plugs. Noted aviation authority reports on Allied Helicopter Service . . .

Uncommon Endurance

by **HERB FISHER**—*international aviation authority, veteran test pilot, author*

"Surveying, lifting machinery . . . bucking winds to hot, thin heights . . ."

The romance of the whirlybird is a dead duck so far as Allied Helicopter Service is concerned. Allied *works* its unglamourous craft—murderously.

Headquartered at Tulsa, this unusual eight-year-old "rugged-duty outfit" hires out on a world-wide basis—spraying, exploring, patrolling, surveying, hauling . . . frequently under almost unbelievably grueling conditions, jungle to Arctic.

As Roy B. David, Allied's President, told me: "For men, it's all *work*. For machines, it's just plain hell."

Herbert O. Fisher

A colorful Oklahoma attorney whose work in corporate aviation law led him to the founding of Allied, David speaks with undisguised admiration for his toiling helicopters:

"These are no dolled-up glamour birds. We tear them down, here in our shops—airframe to engine—down to the last nut and bolt. We custom-overhaul them from the ground up. We weld and innovate. We don't care how pretty they are. They've just got to be tough, beefed up to withstand terrific punishment.

"No engine goes in service until we've made it precision-perfect—able to take almost incredible overwork despite abrasive sand and humidity, subzero weather and hot, thin altitudes. That's why Champion Spark Plugs are so vitally important to us: *They insure dependability* of a good engine. Without a 100% dependable engine, you can wash out in short order in an operational grind like this."

SPRAYING, SEEDING

Allied's main operation now is crop and reclamation spraying—herbicides on pasture lands, forests, rights-of-way, canals and ditches, rice fields; insecticides on croplands, forests, cities—plus seeding of broadcast crops, pine forests, strip mines, grazing lands.

On the foreign front, Allied is spraying 50,000 acres of bananas per *month* in Guatemalan river-bottom. Eight 'copters plus pilot and mechanic crews are on the job. This operation represents a 5-million-dollar-a-year crop savings to banana growers, David said.

Rugged duty, for certain: With skids ofttimes touching banana leaves—darting in and out of jungle-bordered corners, day after day—each second of flight is critical. There can be no margin for error. Pilot, airframe and engine must be superbly *fit*:

"We pull our custom-tailored engines every 600 hours, clean spark plugs every 50," David said. "And fortunately for us, we can buy Champions in Guatemala City—as well as nearly any place else in the world.

"Helicopters, you know, work plugs much harder than do other aircraft, subject them to much severer operating conditions. When you consider that helicopter engines operate *constantly* at the high RPM that airplanes use only on takeoff — which means high electrode erosion and shorter plug life—this

Allied on oil survey . . . swamp near Morgan City, L

should floor you as it has us:

"Our plug life is 600 hours."

One of Allied's more spectacular home-front projects involves spraying 1,000,000 acres of mesquite in Texas and dense scrub in Oklahoma: "Remove that worthless mat and you'll have the best cattle country and farmland in the U.S.," reclamation experts had predicted.

"Carving farm and rangeland out of backcountry like that really gives our grasshoppers a workout," David told me. "And already a lot of that 'worthless mat' is cow-belly-deep in grass!"

On an "ordinary" herbicide and insecticide spraying job, I watched Allied 'copters clipping along the ground and shuddered. I watched them snuggle into corners of fields—right up to border vegetation and obstructions—then pivot sharply "at the last minute," spraying again, without drift, a return swath in three to five seconds. They'd land anywhere, anytime—taking on fuel and chemical in mere minutes. Then off again.

"That's real precision work," David said pridefully. "It's more than teamwork. Like the old cowhand and his horse, the helicopter pilot and his machine *must* operate as *one unit*. The man out there, Herb, is a *part* of his 'copter—and that engine is his heart. He wants it strong—fired to life by *dependable* spark plugs."

Allied has sprayed several thousand miles of power line and railroad right-of-way from Texas to Illinois. A special controlled width device—developed by Ozzie York, Vice President-Maintenance and former RAF pilot—cuts a swath without harming valuable crops or timber to either side.

"Spraying, skids raking foliage . . ."

In Allied's vast forest and range reclamation projects, this equipment is used with chemicals that kill certain plant species without harming desirable vegetation: pine stands aloof and healthy, for example, while other trees and underbrush die.

SURVEYING

From Arizona to Alaska and Iceland, Allied has done government surveying and transplanting of heavy equipment and manpower where it's ofttimes impossible by other means.

In Iceland, Allied operated with the U.S. Army Map Service.

In Government uranium exploration in Alaska, Allied had to heat motor oil before it could be used: "I swear, when it's 40 below up there, I think we must have sometimes drunk the oil and poured hot coffee in the 'copters, so *un*romantic was *that* duty!" David said.

With the U.S. Geological Survey and Atomic Energy Commission, Allied 'copters invaded 17,000 square miles of some of the most inaccessible wilderness on earth—the Four Corners country of Utah, Arizona, Colorado and New Mexico. Here, Allied helicopters bucked wind currents from gorge bottom to heights where hot, thin air made hovering nearly impossible. They shuttled surveyors to hundreds of these pinnacles—averaging 8 to 10 miles apart — so they'd have abundant triangulation points for mapping 20- to 40-foot contour intervals. They lugged up machinery, explosives and timbers, and, between tasks—to test thermodensity lift—they'd haul boulders several thousand feet up from the canyon floors.

In Alaskan Geological Survey operations, 'copters pitched among icy mountains to cut field costs for mile-to-inch mapping from $25 a square mile to less than $8.

OIL EXPLORATION

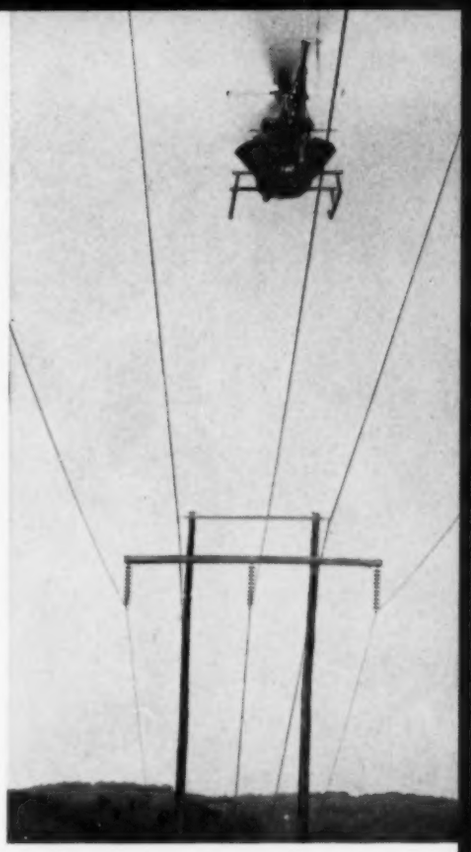
Allied has operated under contract to major oil companies from South American jungles through Louisiana swamps to the Canadian Rockies and Alaska.

Before first wells came in on now productive southwestern United States test sites, Allied whirlybirds were scouting the badlands for Gulf Oil. Explosives used in refraction shooting were shuttled quickly from "shot station" to "shot station" in this almost impossible country. Such treks previously took 100 men, each packing one case of dynamite, three days.

In Alaska and the Canadian Northwest, Allied's "grasshoppers" opened previously inaccessible areas for Phillips Petroleum, hauling supplies as well as flying geological survey missions.

In South America, Allied packed instruments, drills, explosives and camp supplies through dense jungles—covering in 45 minutes what had taken natives six days to traverse. Here, Champions protected against hazardous flashover caused by hot, moist operating conditions.

Night patrol . . . (r/l) Roy B. David, Allied President; Osvil York, V.P.-Maintenance



"Hustling along hazardous hot-wire trails . . ."

In our own Gulf States, Allied air-lifted to isolated swamps everything from drilling apparatus to explosives. Seismograph crews didn't even get wet feet: the pontooned 'copters dragged surveyor chains, held the stake and flew sideways, up, down and backwards at the surveyor's signal.

PATROLLING

"Rugged" characterizes Allied's patrol duty, too.

With the Tennessee Valley Authority, for example, Allied 'copters skittered along 8,000 miles of high-voltage transmission line for 3½ years for a close check of line or insulator damage—impracticable by ground inspection.

On frost control projects in Oklahoma and Kansas, Allied flew low along telephone-telegraph lines so powerful rotor downdraft would jar accumulated ice off wires threatening to snap!

"Whether hopping about a pocked desert or combing bugs out of the jungles, it's *rugged duty* that you have to live with every day to really comprehend," David said. "It takes quite a crew, quite a craft, quite an engine—and, quite a spark plug. You can't buy a more serviceable, dependable spark plug than Champion. *We know*. We've got the operation to *prove* it —as I used to say in the courtroom—'beyond any shadow of a doubt.'"

CHAMPION SPARK PLUG CO.
TOLEDO 1, OHIO

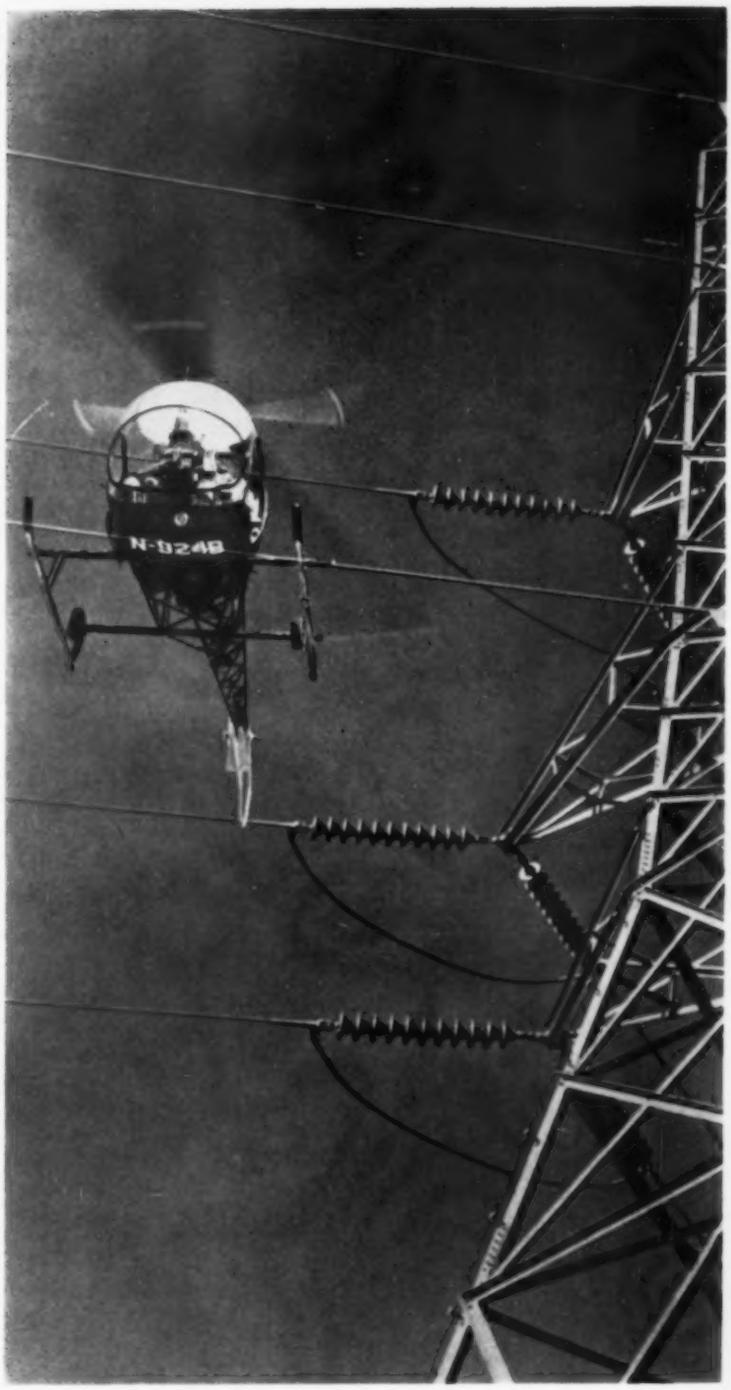
How much could a Bell Helicopter save your company?

Simple problem in arithmetic: you have 440 line-miles to patrol and it takes two men *37 man-days* to make a ground patrol. Aerial patrol by Bell helicopter takes *14 flight hours* for the same job. How much does the Bell save in money, men and time? One utility company, with this exact problem, found the answer to be: $200 saved on every patrol; two trained linemen released for other duties almost 100% of the time; hundreds of hours saved.

There are countless jobs a Bell can do — construction men, oil operators, manufacturers — businessmen in many categories are finding this out every day. How about you? Would a savings in time and expense be welcome to your company? Then let us tell you more about the Bell — explain the three convenient ways you can use it — by Charter Service, Bell's own Lease/Purchase Plan, or Outright Purchase. Write Dept. 12E, Bell Helicopter Corp., Fort Worth, Texas.

Watch "WHIRLYBIRDS" on TV . . .

consult your local paper for time and station

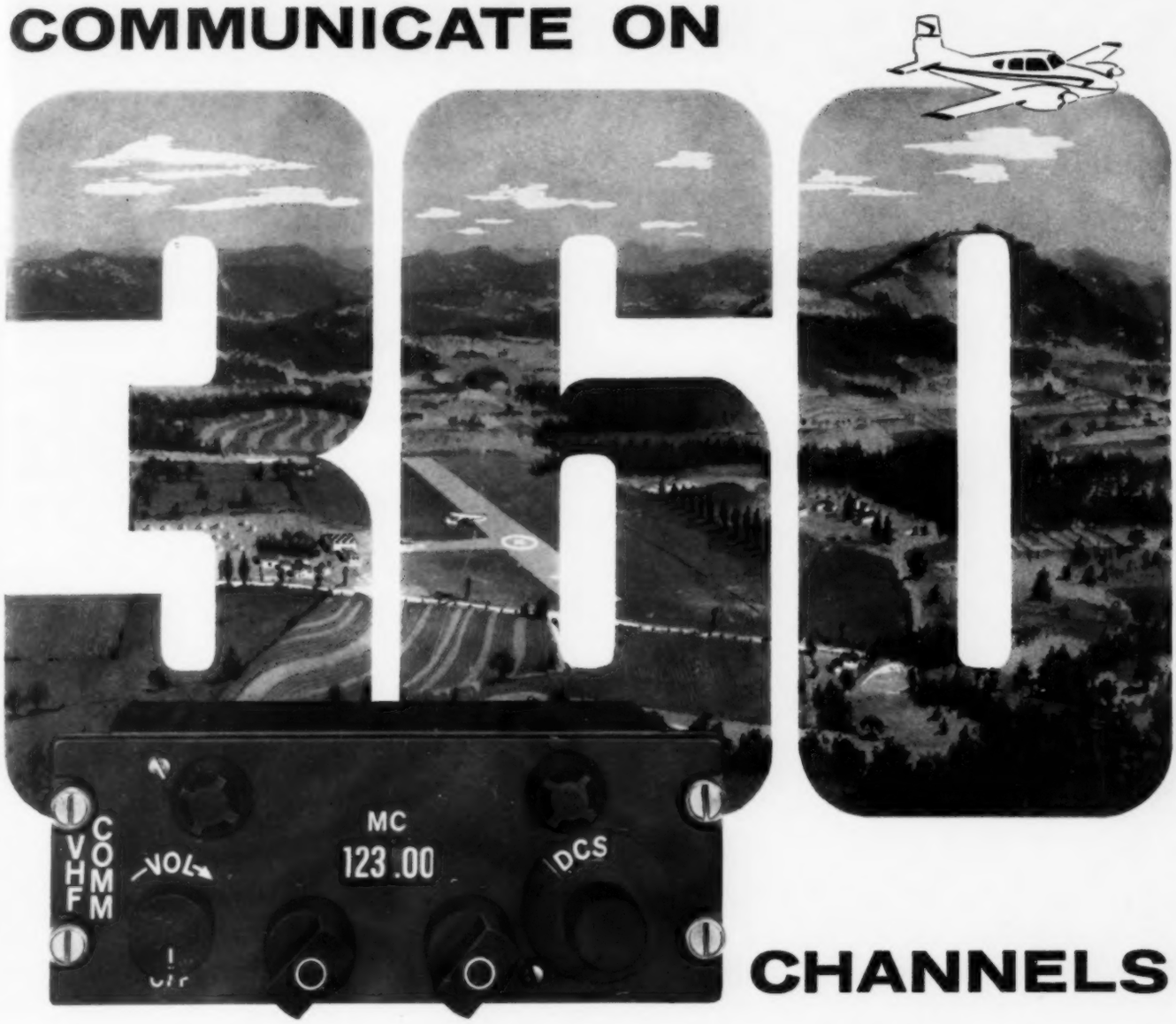


BELL Helicopter CORPORATION

Subsidiary of Bell Aircraft Corporation

Fort Worth, Texas

COMMUNICATE ON



CHANNELS

WITH ARC's TYPE 210 TRANSCEIVER

The rapidly increasing volume of air traffic and the need for more precise traffic control has necessitated a tremendous increase in the number of assigned radio frequencies to carry on the necessary air-ground communications.

Only a few years ago pilots could operate with 10 or 20 channels. Later frequencies were increased to 80 or 90. Plans now call for 360 frequencies—enough to meet the need for years to come. In view of this channel increase, ARC now offers an all-channel, flight proven transmitter-receiver (Type 210 Transceiver) covering all 360 channels. The powerful 15 watts guarantees optimum distance range and the knifelike selectivity assures freedom from adjacent channel interference. Provision has been made for the selective use of single or double channel simplex whereby transmissions are made on a frequency 6 megacycles higher than the receiver frequency. There is no wait between receiving and transmitting for re-channeling.

This is ARC's latest contribution to air safety. Ask your dealer for a quotation to include a single or dual installation, along with other units of ARC equipment listed below.

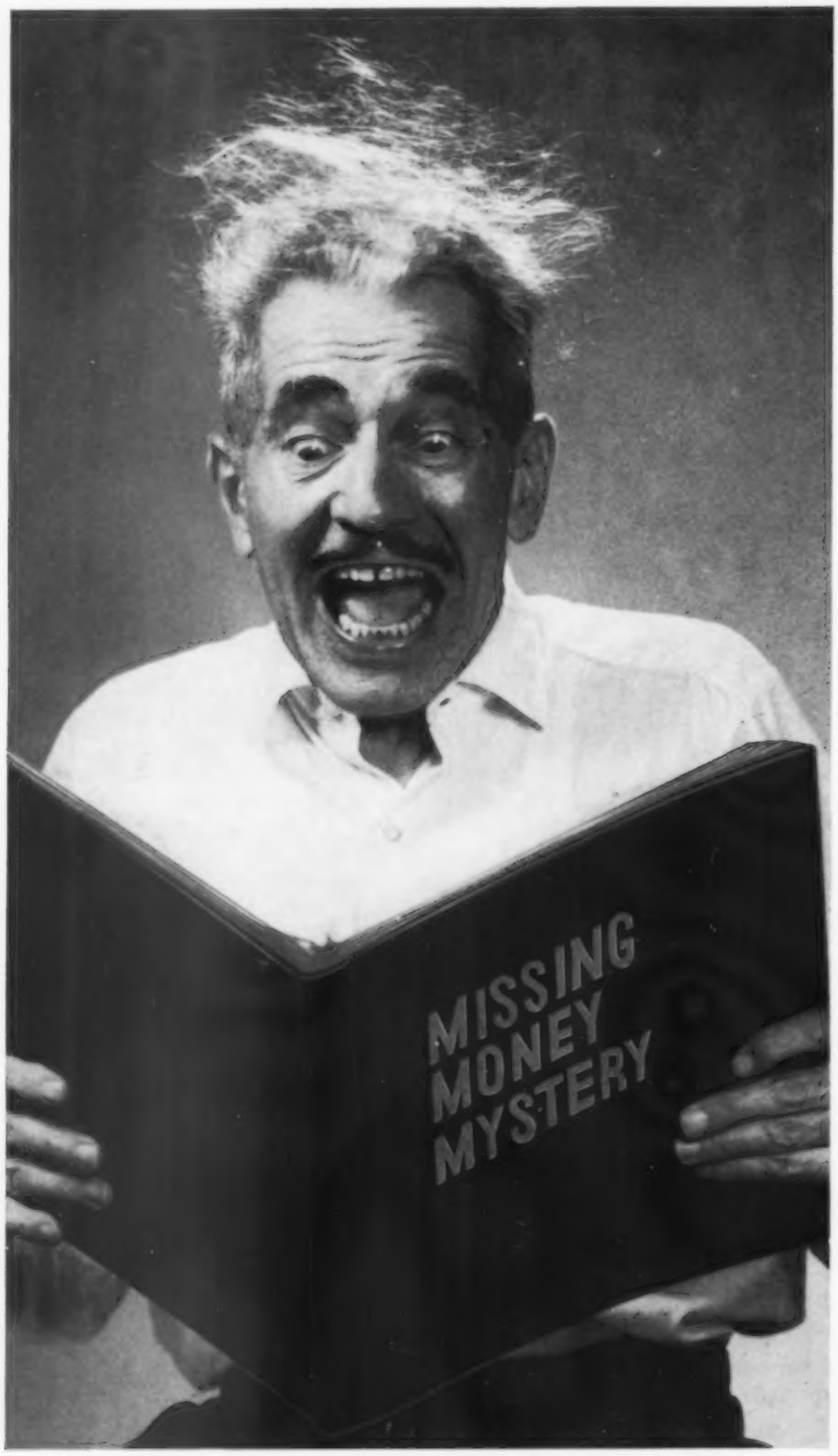
Dependable Airborne Electronic Equipment Since 1928

Aircraft Radio Corporation BOONTON, N. J.

30 YEARS OF ACHIEVEMENT IN AIRBORNE ELECTRONICS 1928 ARC 1958

OMNI/LOC RECEIVERS • MINIATURIZED AUTOMATIC DIRECTION FINDERS • COURSE DIRECTORS • LF RECEIVERS AND LOOP DIRECTION FINDERS
UHF AND VHF RECEIVERS AND TRANSMITTERS (5 TO 360 CHANNELS) • INTERPHONE AMPLIFIERS • HIGH POWERED CABIN AUDIO AMPLIFIERS
TONE CHANNEL ISOLATION AMPLIFIERS • OMNIRANGE SIGNAL GENERATORS AND STANDARD COURSE CHECKERS • 900-2100 MC SIGNAL GENERATORS

Mystery of Missing Maintenance Money Solved



160 CLUES FLAT-RATED FOR BUDGET-MINDED READERS

For years, airmen have been perplexed by the famous, re-occurring Mystery of the Missing Maintenance Money — or, in brief, The Case of the Final Bill Which Didn't Jibe with the Preliminary Estimate.

The solution, as reported by Southwest Airmotive: More than 160 new Flat Rates on labor for essential services on DC-3, Lodestar, Ventura, Beechcraft, Aero Commander, Cessna, and Navion aircraft, engines, accessories, and propellers.

The mystery entirely unravels when you know in advance how much the job will cost you, SAC investigators report.

Southwest Airmotive also provides the industry's most accurate predictions on parts costs and delivery schedules, including those for numerous original STC modifications approved for your airplane by the CAA.

Write the Service Sales Manager for details on Flat-Rated, Budgetary Maintenance Planning.

Southwest Airmotive Co.

LOVE FIELD, DALLAS

DISTRIBUTION DIVISIONS: KANSAS CITY • DENVER

1932 A QUARTER CENTURY OF LEADERSHIP 1958

Just among ourselves

Ivory Tower Regulations

FOR many years this publication, along with other elements in aviation, has tried to convince the Federal civil aviation agencies that the industry should have more participation in formulating or changing regulations well in advance of the official proposals that go out from time to time. Failing the accomplishment of this method of originating changes in the civil air regulations the Federal agencies might well consult more frequently with recognized spokesmen for civil aviation.

Since 1938 the practice has been for the Civil Aeronautics Board, in cahoots with the Civil Aeronautics Administration, to originate new regulations or changes in the ivory towers of Washington bureaucracy, mimeograph the proposals and mail them out to a select mailing list asking for written comment by a certain date. If you do not receive one of these invitations to comment, or read about it in published reports, as thousands of airmen never do, the regulation goes into effect without benefit of your opinion. Since the CAB has dictatorial power over civil aviation there is nothing in the law to require them to pay any attention to comment even after it comes in. However, universal protest ends in a public hearing or in extensions of time and moderate or insignificant protest generally results in eventual adoption of the proposed changes.

We are firmly convinced that the regulations establishing the supplemental type certification requirements were sneaked through back in 1956. In all our research on this crippling regulation we've failed to find one repair shop executive who received a proposal and it was nearly a year after its adoption before the people most affected even knew such a regulation was on the books! Under the present system it is entirely possible to "sneak" a highly restrictive or controversial regulation through the ivory tower system with a minimum of industry study or comment.

There has been a veritable flood of proposed changes to the civil air regulations in recent months. Fortunately most of them are being widely publicized and the people affected are having a chance to at least comment on the proposals. But the comment may or may not result in elimination of the restrictive aspects or serve to make the proposals more digestible to airmen.

This flood of new proposals extending from student flight instruction requirements to the kind of radio we must carry in our airplanes makes it clear that the heat is on general aviation. Some observers maintain that it all started with the tragic Grand Canyon accident after which word went down from "the top" demanding a tightening up all along the line. Others attribute the rash of new regulations to empire building within the CAA. Still others maintain that many changes in the CAR are necessary but that they are presently being drafted by people who know nothing about civil aviation. There is perhaps a measure of truth in all these assessments of what inspired the rash of new regulations.

Far be it from us to deny the need to keep our civil air regulations abreast of the times. They should not be static. All we ask for is an end to the empirical methods used to cram them down our throats. There was a day when our Federal aviation agencies were partners to the industry, when dedicated men were willing to work with the spokesmen and leaders of the industry for civil aviation progress. That condition does not exist today.

We desperately need a Civil Aviation Conference with all of civil aviation elements officially represented and with officially appointed spokesmen from the CAA, CAB and the FCC Airways Modernization Board and the Weather Bureau. Past experience has shown that when the citizen sits down frequently with the public servants in government a great deal of mutual benefit derives. We believe that such a conference could uncover better methods for overhauling the regulations and for creating a healthier atmosphere in which to solve the serious problems we all know exist.

Today a tremendously wide gap exists between the user of our airspace and airports and the people who regulate them. Bad blood flows in an unhappy atmosphere of mutual distrust. The next step is for a big rhubarb to break out with congressmen getting complaints from their constituents and the congressmen turning their fire on the agencies involved. This system produces little more than an accelerated flow of bad blood and more recrimination.

If the civil aviation agencies won't take the initiative for a national clinic or conference on present problems affecting civil aviation in this nation then the industry had better provide the impetus. Otherwise we'll be subject to the worst kind of dictatorship that crams regulations and restrictions indiscriminately down our throats without proper representation. There is too much evidence pointing to the fact that this process of ivory tower dictatorship is now in the yeasting stage. It would be wise to nip it in the bud.

Honest Aircraft Performance

A GROWING number of readers constantly challenge the aircraft manufacturers' performance figures usually published with any write-up of a new model. This publication learned long ago that it is impractical for us to police the aircraft industry for exaggeration of performance figures. We have tried many methods of flight analysis but always find ourselves in the position of second-guessing the manufacturer. It would require a fully equipped test center with a staff of engineering test pilots and other technicians not to mention separate instruments and other equipments, far beyond a trade journal's means or capacity.

Besides, what an independent test of any one model finds this week

might not hold true next week because of constant improvements and modifications going on in our factories. We've had that happen to us between the time a story was written and the time it came off the press.

Fortunately for commercial aviation, the industry has moved into an era of greater integrity of product and service. We admit there is still considerable room for improvement. But the fact remains that the companies with integrity are usually the successful ones. You can't fool all of the people all of the time.

Nearly everybody is inclined to exaggerate performance. Most owners do over their airport coffee cups. That's why you see spirited flight competition to check certain airplanes and to compare them in actual "combat." That's why it is so often a sporting proposition with bets on the side.

We agree it would be better if there were more honesty, or rather, less exaggeration of performance figures. We go to great lengths and expense for accuracy in even the most routine reporting. But we would be the other man's dupe in any effort to expert his airplane's performance on anything but a general basis, which would allow plenty of margin for all the factors affecting performance from one to another aircraft off a production line, from one customer's technique to the next, from differences in engines, propellers and number of antennas in the drag factor.

Over the years we have come to believe that a manufacturer should know from experience just how much integrity really means, and base his claims accordingly. He must set up his own reasonable method and stick to it, allowing for all tolerances known to him, and let his competition rise or fall on their own methods of keeping the buyer satisfied. After all, word of mouth advertising and repeat business are mighty important factors in the business of selling airplanes.

Mike Todd: Why?

WE have a letter from a reader which says a lot of things many of us in this business have wondered about regarding the aircraft accident which took the lives of Showman Mike Todd and his crew and associates. A number of difficulties are said to have piled up to cause the tragedy in the mountains of New Mexico during a night flight through weather. Any attempt to "expert" this accident before the facts are officially listed would be half-baked. But there is justification for the discussion we received in the mail from a friend. We offer it, therefore, as follows:

Mike Todd: Why? Perhaps others are asking the same question. By others I mean all the people concerned with aviation — the flight crews, salesmen and shops. Don't you feel that we owe ourselves the answer or answers?

Was Mike Todd oversold or undersold on aviation or the equipment he had purchased at what amounted to a tidy sum, his life? What about the other Mike Todds or executives we are flying — people who are the leaders of our industry, people with strong, aggressive minds. Should they not be informed of the limitations of their own aircraft? They should not only be sold on the job that they will do safely, but also on the limitations or conditions that will require other modes of travel. It is our duty to sell aviation to these people in a true light. (EDITOR'S NOTE: We know of executives who insist on going regardless of limitations.)

It is also our duty to work toward the day we will have better aircraft to do our job with — pressurized aircraft, radar-equipped aircraft, longer-range aircraft and de-icing systems that will get the job done. Until that day, is it wrong to suggest to our passengers that they use the airlines when we know the picture for a proposed flight will require high-altitude flying?

We are in a business where every venture must be a success. We must inspire confidence in all those who put their trust in us. We owe it to them and we owe it to ourselves.

There are many in this picture called aviation — the manufacturers of our aircraft; the aircraft sales people and these are most important for they have a lot to sell; the pilots who fly the aircraft and may I emphasize the necessity for keeping proficient in our trade; and then the men we sometimes fail to appreciate fully — the men who maintain and service our aircraft; maybe if we showed our appreciation we would be rewarded with work that is done with pride and parts used that we could put our trust in. (EDITOR'S NOTE: A fair price for quality workmanship and quality parts is not always appreciated by some aircraft owners, too many of whom resort to chiseling good maintenance men right out of profits and wind up with the junkies.) There are others we all depend on so much — the weathermen, the controllers, communicators and the tower operators.

Don't you agree that there are a lot of us in this picture called aviation? We are never alone, except when someone fails. In Mike Todd's case, someone did just that.

Flight Magazine Salutes:

★ ★ ★ **HONORABLE JAMES R. DURFEE,** Chairman of the Civil Aeronautics Board, who told the Association of Local and Territorial Airlines last month that some drastic revision in approach to their mail rate problems must be found, that the Board's basic objective will be to provide definite subsidy standards . . . within which carriers will have the freedom, and the profit and loss incentive, to conduct their operations as good management judgment dictates.

★ ★ ★ **ROBB C. OERTEL** of Esso Standard Oil Company who, as president of the relatively new National Pilots Association, has built that organization up into a hard-hitting democratic organization for pilots with unprecedented prestige and influence.

★ ★ ★ **OLIVE ANN BEECH,** president of Beech Aircraft Corporation, and cohorts for increasing Beech stockholders equity by seventy-five per cent in the past three years. Beech earnings after taxes for the first six months of the fiscal year were $1,633,498 as compared to $1,586,406 for the same period in fiscal 1957.

★ ★ ★ **NANCY NARCO,** mythical young lady with very real advice on matters of aviation radio, whose regular column in Narco's advertising program has developed one of the widest readership ratings in aviation. In fact, Nancy has become so "real" she's getting love letters from pilots! Narco Adman Bill Strohmeier reports that her offer to supply free copies of "How to Fly Omni" swamped Narco with thousands of requests but for all to be patient as a new press run is in the mill.

★ ★ ★ **RICHARD S. BOUTELLE,** president, and **JAMES PFEIFFER,** director of customer relations of Fairchild Engine and Airplane Corporation for selling approximately 100 F-27 turboprop transports without benefit of a demonstrator, certainly some kind of new aviation sales record. First production model of the F-27 was successfully test flown with appropriate ceremonies at Hagerstown, Maryland.

NARCO SCORES ANOTHER IMPORTANT BREAKTHROUGH

ALL-CHANNEL

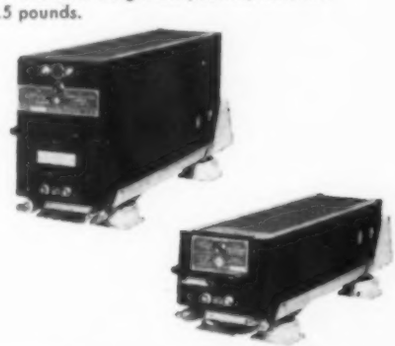
Sapphire

1016A

VHF RECEIVER-TRANSMITTER

with TRANSISTORIZED POWER SUPPLY

SAPPHIRE 1016A IS CAA TSO'd for scheduled airline use. Unitized construction permits rapid disassembly and unusual accessibility for servicing. Panel-mounted control switches provide crystal controlled frequency selection for SCS, DCS, or random cross-channel operation. Provision included for simultaneous channeling of glide slope receiver when used for ILS. Unit weight 22 pounds; antenna 3.5 pounds.



SAPPHIRE 1021 90-560 CHANNEL VHF RECEIVER. The receiver unit of the 1016A is now offered as a separate all-channel receiver with transistorized power supply in a short-height ½ ATR unit. When coupled with VOR/LOC converter, permits rapid, precise crystal controlled tuning to all NAV as well as COMM frequencies. Designed especially for the remarkable "2½ Sapphire" system, that gives unusual NAV/COMM flexibility and rapid switching of functions to relieve cockpit load.

TRANSISTORIZED POWER SUPPLY reduces weight of 1016A by 4 pounds, length by 3½ inches, is nearly twice as efficient as equivalent dynamotor units. With no moving parts, malfunction is virtually eliminated. Thoroughly proved in thousands of hours of flight and accelerated laboratory testing.

MORE POWER, LIGHTER WEIGHT, SMALLER SIZE AND EVEN GREATER RELIABILITY have been engineered into this new Sapphire 1016A VHF communications unit. Thanks to the development by Narco of a revolutionary transistorized power supply, this latest addition to the popular Sapphire series of airline-quality equipment is more than ever the logical choice for airlines and executive aircraft users for an all-channel VHF communications unit.

The Sapphire 1016A provides you with a 90 to 360-channel transmitter with greatly increased power covering every channel with 50 kc spacing between 118 and 135.95 megacycles; and a 90 to 560-channel receiver covering every frequency from 108 to 135.95 megacycles, with the all-important advantage of permitting crystal controlled tuning to VOR/LOC navigation frequencies.

Sapphire 1016 series equipment is in scheduled airline use, has been re-specified for the U. S. Air Force's Cessna L-27's and is in use in hundreds of corporate aircraft.

You'll select the Sapphire 1016A because it provides you with all-channel transmission, all-channel reception both NAV and COMM, because it's years ahead in design and reliability, because it's CAA TSO'd for airline use and because it's sensibly priced. See your Narco dealer or write for new brochure.

narco

National Aeronautical Corporation, Fort Washington, Pennsylvania

MARK OF THE FINEST COMMUNICATIONS

Sapphire 1016A

90/360-CHANNEL TRANSMITTER
90/560-CHANNEL RECEIVER

THE NEW 200 *mile-per-hour*
BEECHCRAFT TRAVEL AIR

the QUIETEST
plane in the
skies

So quiet you won't believe it... so vibration-free it's like sitting in your own office... so luxurious, so smooth, so much more for your money... that's the All-New Beechcraft Travel Air for 1958. A demonstration ride will prove that this is the truly outstanding airplane in the light twin field!

A quarter century of experience has gone into the New 1958 Travel Air. Its rugged and right design assures maximum performance and durability. But with rugged construction also comes the beauty and distinctiveness of superior styling.

The Travel Air gives more time to manage, more time to sell. Montreal to Mexico City is an easy Travel Air trip with just one stop for fuel!

Simplicity of flying plus visibility

One of two spacious luggage compartments

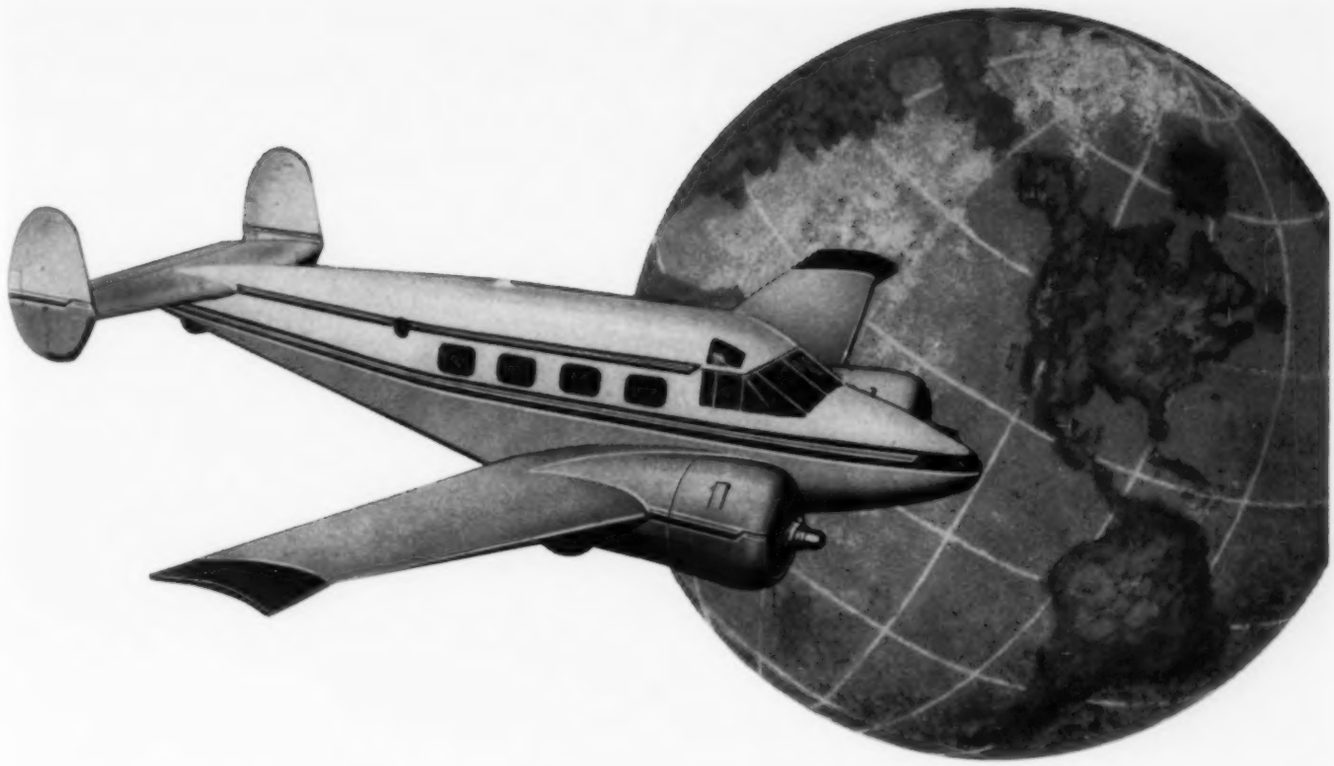
Complete accessibility for servicing

The four-place *Beechcraft* Travel Air
RANGE – up to 1,410 miles nonstop
SPEED – up to 209 miles per hour

Beechcraft

For information about the **Travel Air** and the finest leasing and financing plans in aviation, see your Beechcraft distributor or dealer, or write Beech Aircraft Corporation, Wichita 1, Kansas, U. S. A.

BEECHCRAFTS ARE THE AIR FLEET OF AMERICAN BUSINESS



SUN CHASER—WITH TRANSCONTINENTAL MOBILITY

the BEECHCRAFT SUPER 18 for '58

The 1958 Beechcraft Super 18 is designed to provide Men of Decision with the ultimate in quiet, restful surroundings as they speed to new and broader business opportunities.

Completely private passenger lounge and private lavatory, luggage and pilot compartments are distinctive advantages of Super 18 ownership. At speeds up to 234 miles per hour, miles melt into productive minutes inside your own executive transport.

But the advantages of complete privacy, of walk-around comfort, of having the entire continent at your command are just a few of the reasons why the Super 18 is the most popular airplane of its type in the world.

The eight-place *Beechcraft* Super 18
RANGE — up to 1,626 miles nonstop
SPEED — up to 234 miles per hour

Beechcraft

For information about the **Super 18** and the finest leasing and financing plans in aviation, see your Beechcraft distributor or dealer, or write Beech Aircraft Corporation, Wichita 1, Kansas, U. S. A.

BEECHCRAFTS ARE THE AIR FLEET OF AMERICAN BUSINESS

Test your cross-country memory

Can you name this airport?

Clue: *It's one of the busiest in the East—a hub for executive aircraft.* (*answer below*)

Now check your aviation-oil memory: There are two vital reasons why Gulf oils are better for your engine. Remember them?

1. In addition to providing efficient, thorough lubrication, Gulf Aviation oils help keep engines *clean—and safe!*

2. Gulf-clean engines can go longer between overhauls, because there's less wear and tear on engine parts.

Choose either Gulfpride Aviation Oil Series D, the detergent oil, or Gulf Aircraft Engine Oil, the straight mineral oil—both keep your engine Gulf-clean and safe.

The Airport above is Westchester County Airport, located four miles northeast of White Plains, N. Y. It has three paved runways—the longest is 6,500 ft.

And here, as in airports from Maine to Texas, you'll find that complete and friendly Gulf Service waiting for you.

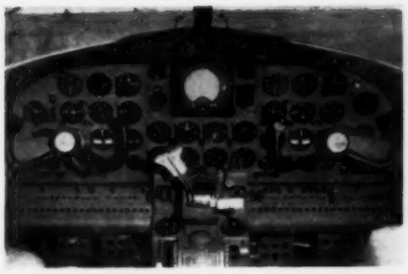
GULF
AVIATION PRODUCTS

the MARK I-A

Newest...

of the Learstars

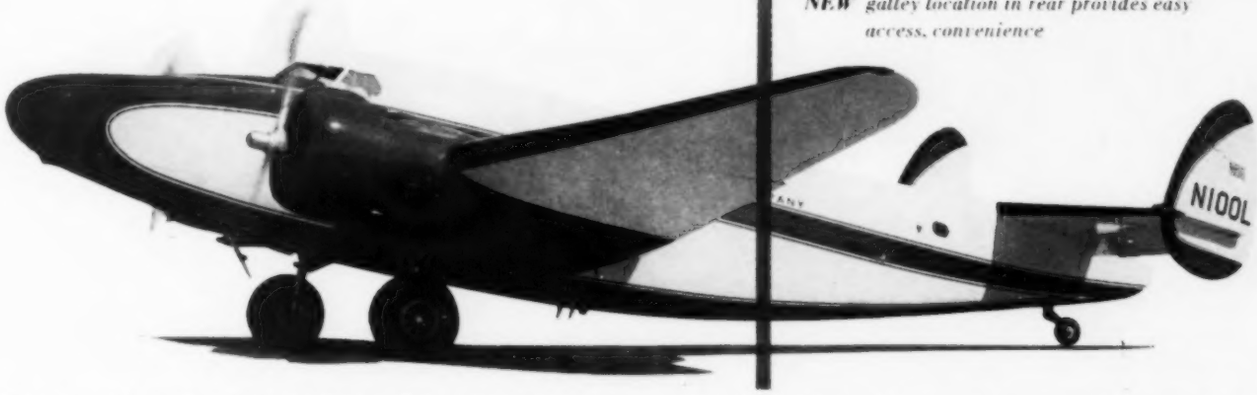
...world's most distinguished business aircraft



NEW "straight ahead" radar screen mounted in LEARSTAR Mark I-A instrument panel

NEW custom-built to Solo Cup Co. specifications is roomy, divan equipped lounge

NEW galley location in rear provides easy access, convenience



This proud *new* Learstar, built for Solo Cup Company, Chicago, represents another triumph in aircraft engineering. Combined are the high performance characteristics of both Learstar Mark I and Mark II. In every measure of safety, power, payload, cruising speed and range, the new Learstar Mark I-A matches the famous Mark I — yet it is offered at a greatly reduced initial cost. Fully loaded, with a crew of two, ten passengers, and 700 pounds of baggage, this new Learstar can travel coast to coast non-stop at a speed of 280 miles per hour. Learstars are the only business aircraft of intercontinental range — the only business aircraft that match airline speed and range.

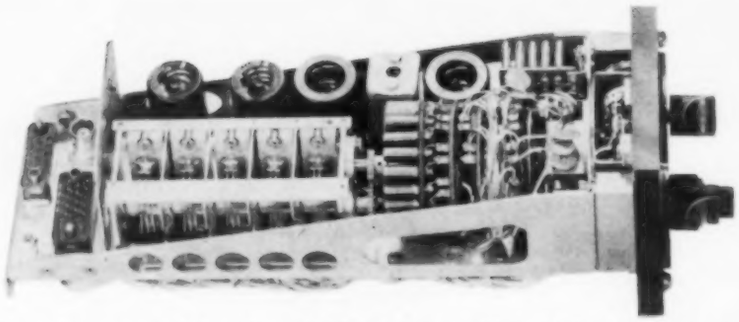
The new Solo Cup Learstar Mark I-A is another fine example of business aircraft engineered and produced with a realistic view of corporate economy. If you now own or contemplate operating business aircraft, it will pay you to investigate the advantages of Learstar — how this superior business transport compares favorably with other business aircraft, both in original cost and economy of operation. For complete information, telephone, wire or write:

PACAERO ENGINEERING CORP.

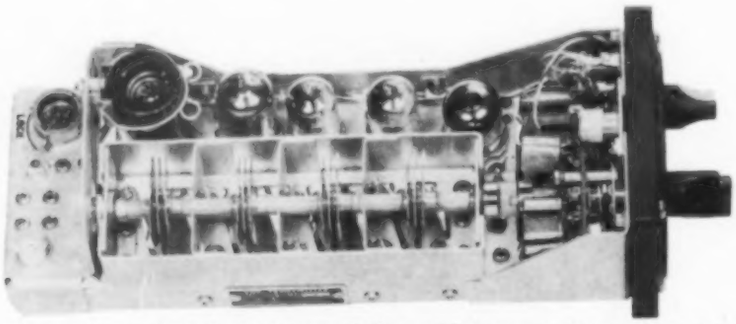
A Subsidiary of Pacific Airmotive Corporation

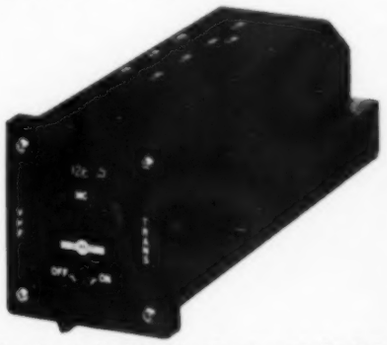
3021 Airport Avenue, Santa Monica, Calif. · EXmont 1-5281

PACAERO



Panel-mounted Collins 51X-3 190-crystal-controlled channel receiver (above) and 17L-8 transmitter (below) use same 427B audio circuitry and power supply. Receiver covers 108 to 126.9 mc., mounts in standard 3-in. cutout, is 9⅜ ins. long, weighs 3.25 lbs., uses 1.75 amps of 27.5 volts dc or 3.5 amps of 13.5 volts dc, and has 4.5-watt output. Omni-localizer indications are obtained with use of 344D-1 converter-indicator, and all switching circuitry for glideslope and localizer receivers is included. All tubes are ruggedized ARINC types. Crystals and variable capacitors are tuned simultaneously for megacycle steps. Front panel is integrally lighted. Note easy to read numbers with digital tuning.





Ninety-channel (118-126.9 mc) Collins 17L-8 transmitter (above) mounts in 3-in. panel cutout, is 8⅝ ins. long, weighs 2.5 lbs., has 3-watt minimum power output, uses 5 amps to transmit, has a frequency-doubling arrangement in which 19 crystals are combined in pairs to give 90 channels. Two tuning knobs control crystal switches, one for megacycles, one for tenth-megacycles. Both 51X-3 and 17L-8 are TSO approved by CAA.

Collins Systems For Lightplanes and Twins

By TOM ASHLEY

PILOTS flying anything smaller than airliners have long envied air transport crews for the completeness and excellence of their Collins Radio equipment for dependable communications and navigation. But even if single-engine and small-twin people had the need and the money for Collins gear, they still could not physically carry the weight and bulk of the wonderful devices — until now.

Times change, and so has the 25-year-old Collins Radio Company. Bigplane electronics made it a big business, especially in research — big enough with 10,000 employes that Collins decided early in 1956 to develop radio equipment for small commercial aircraft. It assigned some of its 2,300 research and development engineers the task of scaling down dimensions, weight and power requirements so that business planes from the smallest to the largest twins could install airlines-quality Collins equipment.

That was 30 months ago. Now Collins has an impressive array of light, small-dimension communications and navigation units for business flying. They have entered production after exhaustive development in Collins laboratories and field-test aircraft, and are being manufactured for delivery now and this fall.

With the new lightweight equipment available now in some units and later in others, Collins has already started greatly expanding its network of sales and service distributors throughout America. Until now, about 30 Collins dealers have been sufficient to cover business flying. In the biggest sales expansion ever undertaken by a manufacturer of aircraft radio, Collins is setting up nearly 200 outlets — 170 additional distributors are being appointed, most of them well-established distributors and dealers of leading business planes such as Aero Commander, Beech, Cessna, Piper and Mooney.

"Collins can now equip every plane from the smallest to the largest with the finest radio and electronics gear we have ever offered and we are making it available at approximately two hundred sales and service stations all over the country, so that Collins gear will be easy to find, easy to buy and easy to install and service," James G. Flynn, Jr., vice president for sales, told us.

The new Collins lightweight equipment features 13.5 and 27.5-volt receivers, transmitters and navigation units so small they weigh less than 3.3 lbs. each and can be instrument-panel mounted in standard 3-in. cutouts.

Incorporated is the newest airline crystal tuning with detents for positive frequency finding without dial hunting and with easy-to-read large numerals. Prices start as low as $400 per unit. All of the units carry full Collins warranties, have met or exceeded CAA, airline and FCC specifications and requirements, and can be operated legally in airliners as well as in lightplanes.

Basic in the new Collins lightweight systems are a new $660, 3.25-lb., 190-channel 51X-3 VHF receiver; a new $400, 2.5-lb., 90-channel 17L-8 VHF transmitter; a $500, 5-lb. 427B-2 unit and a $440, 5-lb. 427B-1 unit

ombining power supply, modulator, IF amplifier and audio amplifier for common use by both transmitter and receiver (used alone, the 17L-8 will work off a $300 427A-1 power supply), and a $1,080, 2.4 lb. 344D-1 omni-localizer converter-indicator for navigation information from the 51X-3 receiver.

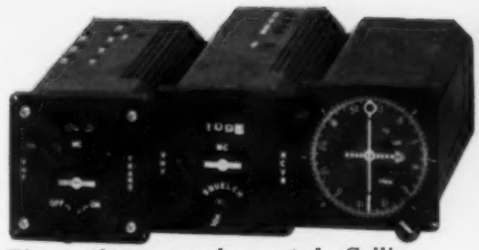
Those four units, installed as a package, weigh a total of only 13.2 lbs. and represent a $2,640 investment plus installation.

Here is a list of new Collins equipment with descriptive data and pricing, from which various "packages" can be selected:

17L-8 VHF transmitter, contained in standard 3-in. instrument case 8⅝ ins. long for instrument panel mounting; weight 2.5 lbs.; 27.5 volts (17L-8A version uses 13.5 or 27.5 volts), 5 amps or 2.5 amps to transmit; crystal tuning; 3-watt output; 90 channels, 118-126.9 mc with 100-kc spacing; $400 (less power supply and modulator).

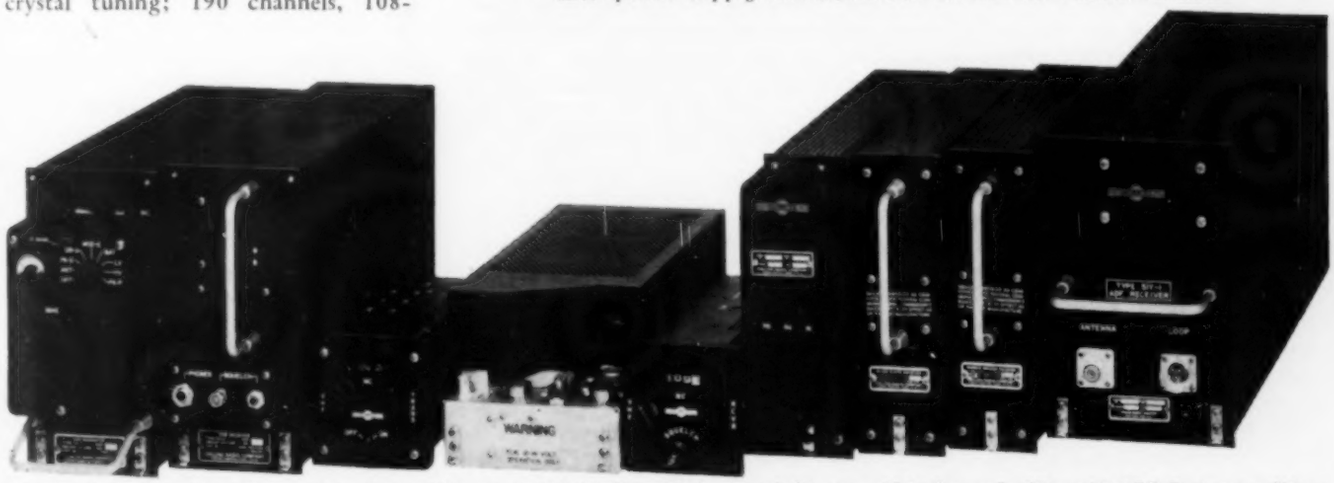
51X-3 VHF receiver, contained in standard 3-in. instrument case 9⅜ ins. long for instrument panel mounting; weight 3.25 lbs.; 13.5 volts or 27.5 volts, 3.6 or 1.75 amps to receive; crystal tuning; 190 channels, 108-126.9 mc with 100-kc spacing; $660 (less 427B power supply and IF unit).

NOTE: 17L-8 and 51X-3 use a common power supply, the 427B-1 or -2, which are of ½ ATR short size, weigh 5 lbs., combines power supply, modulator, IF amplifier and audio amplifier. On transmit, it furnishes voltages necessary for the transmitter and the audio circuit acts as the modulator for the transmitter; on receive, the power supply furnishes voltages for the receiver. The common audio system furnishes 200-mw side-tone for phones and 4.5 watts for the speaker. It also has provisions for three mixer inputs from marker beacon, ADF or other receivers. The unit is fully transistorized and operates from either

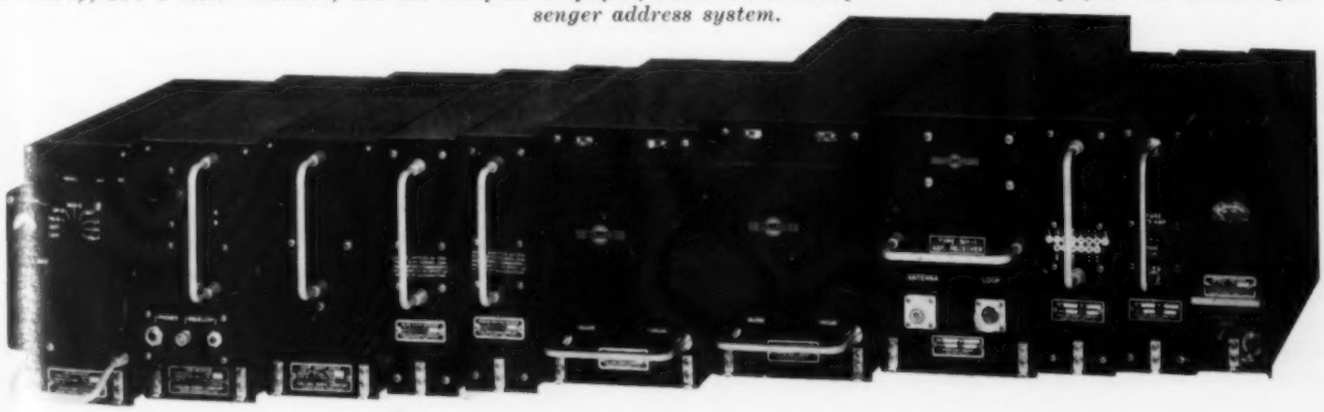


These three panel-mounted Collins units total 8.15 lbs. Left to right are 90-channel 17L-8 transmitter, 190-channel 51X-3 receiver and 344D-1 omni-converter-indicator.

Here's a 27-lb. Collins package with the three units shown at top plus a 5-lb. 427B power supply and 3.8-lb. 51Z-2A marker beacon receiver.

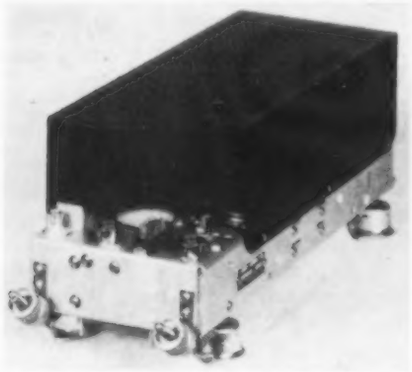


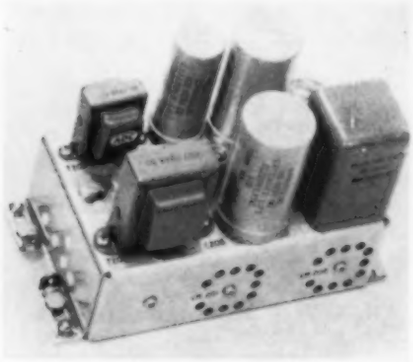
For light twins, the nine units above add up to 83.45 lbs. Left to right are 680-channel, 25-watt 17L-7 transmitter; 880-channel 51X-2 receiver; 90-channel 3-watt 17L-8 transmitter; 5-lb. power supply; 190-channel 51X-3 receiver; 344A-1 omni-converter; 51V-3 10-channel glideslope receiver; 51Z-2 marker beacon receiver, and 51Y-1 ADF receiver. BELOW: left to right are 17L-7 transmitter, 51X-2 receiver. 344B-1 omni-converter, 51V-3 glideslope receiver, 51Z-2 marker beacon receiver, 562A steering computer and 562C computer amplifier (for AP-101 autopilot including FD-104 flight director), 51Y-1 ADF receiver, MC-102 compass amplifier, 346A-1/B-1 interphone isolation amplifier and 346D-1 passenger address system.



This 4-lb. Collins 331H-1 course selector indicator provides full navigation indication service when used with the 51X-3 receiver or the 51X-2 receiver and 344A-1 or 344B instrumentation units and the 51V-3 glideslope receiver. Knob selects digitally-presented course. Window at left presents to-from indication.

New power supply units include 427B (below, left) and completely-transistorized 427A-1 (right). The 427B serves as IF amplifier, audio amplifier and power supply on receive with the 51X-3 receiver and modulator and power supply on transmit with the 17L-8. It measures 14 by 5.3 by 5.3 ins. and weighs 5 lbs. The 28-volt 427A-1 transistor power supply weighs less than 3 lbs., measures 7 by 4.5 by 3.5 ins., and needs no shock mount.





13.5 or 27.5 volts interchangeably.

344D-1 omni-localizer converter indicator, fits standard 3-in. instrument cutout; weight 2.4 lbs.; 13.5 volts at 0.2 amps; $1,080. NOTE: This instrumentation operates in conjunction with 51X-3 receiver to provide navigation.

51Z-2 marker beacon receiver, fits ¼ ATR short rack; weight 3.8 lbs.; 27.5 volts at 0.77 amps.; crystal tuning; 75-mc; includes integral 516B-3 dc power supply, 3-lamp module and transistor switching; $700. (51Z-2A has integral 516B-3 dc power supply for 13.5 volts at 2.6 amps.)

51V-3 glideslope receiver, fits ¼ ATR short rack; weight 6.4 lbs.; 27.5 volts at 1.2 amps dc or 115 volts ac; crystal tuning; 10 channels, 329.3-335.0 mc; integral power supply; $1,120.

51X-2 VHF receiver, fits ⅜ short ATR rack; weight 10.5 lbs.; 27.5 volts at 1.2 amps dc or 115 volts ac; integral power supply; crystal electrical remote tuning; 880 channels, 108-151.95 mc; $2,416.

344B-1 omni-converter, for use with 51X-2 receiver; fits ⅜ ATR rack; weight 14 lbs.; 27.5 volts dc at 0.1 amps and 115 volts 380 to 420 cps at 1.9 amps; includes RMI servo amplifier, OBI and power supply, fail-safe flag warning circuitry; $2,500.

17L-7 VHF transmitter, fits ⅜ ATR short rack; weight 14 lbs.; 27.5 volts at 6.5 amps dc or 115 volts ac; integral power supply; crystal electrical remote tuning; 25-watt output; 680 channels, 118-151.95 mc; $2,768.

344A-1 omni-converter, fits ¼ ATR short rack; weight 9 lbs.; 27.5 volts at 0.8 amps dc; integral power supply works in conjunction with 51X-3 or 51X-2 receivers; $1,560 with dc, $1,580 with ac.

331H-1 course selector indicator, fits standard 3-in. cutout; weight 3.2 lbs.; instrumentation for 344A-1 or 344B-1 omni-converter; $860.

This listing provides a selection of equipments to which other, more well-known Collins gear can be added as desired, including a full range of systems complete enough for the most modern jet airliners yet to be delivered.

Here are some typical system "packages" available from Collins, which illustrate both the completeness and the light weight available:

Single-Engine System

COMMUNICATIONS: 190-channel, crystal-controlled, 51X-3 receiver, 3.25 lbs.; 90-channel, crystal-controlled, 3-watt 17L-8 VHF transmitter, 2.5 lbs.; 427B-2 power supply, 5 lbs. NAVIGATION: VOR-Localizer receiver, 51X-3, 3.25 lbs.; 427B-2 power supply, 5 lbs.; 344D-1 omni-converter-indicator, 2.4 lbs.; 51Z-2A marker beacon receiver, 4.9 lbs. TOTAL WEIGHT: 26.3 lbs. This system uses only 8.05 amps, 13.5 volts dc.

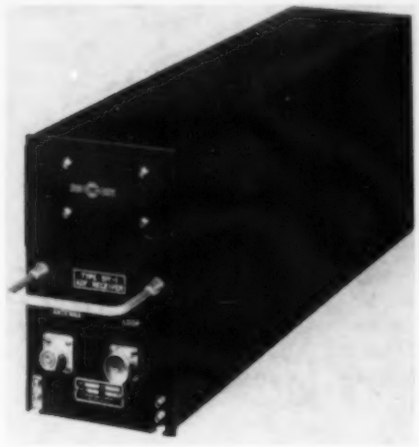
Light Twin-Engine System

COMMUNICATIONS: 880-channel, crystal-controlled 51X-2 VHF receiver, 10.5 lbs.; 680-channel crystal-controlled, 25-watt 17L-7 VHF transmitter; 90-channel, crystal-controlled, 3-watt 17L-8 standby VHF transmitter, 2.5 lbs.; NAVIGATION NUMBER 1: 51X-2 VOR/LOC receiver, 10.5 lbs.; 344B-1 omni-converter, 14 lbs.; RMI 332C-1 dual-pointer (ADF and 344B-1), 2 lbs. FLIGHT DIRECTOR: FD-104 computer, gyro and instruments, 28.5 lbs. NAVIGATION NUMBER 2: 51X-3 VOR/-LOC receiver, 3.25 lbs.; 427B-1 power supply, 5 lbs.; 344A-1 omni-converter, 9 lbs.; 331H-1 course selector indicator, 3.2. lbs. AUTOMATIC DIRECTION FINDER: DF-201 ADF, including antenna, receiver and control head, 30 lbs. COMPASS: MC-102 gyro compass including gyro, flux detector, amplifier and slave indicator, 14.3 lbs. INSTRUMENT LANDING SYSTEM: 10-channel 51V-3 glideslope receiver, 6.4 lbs.; 3-light 51Z-2 marker beacon receiver, 4.9 lbs. TOTAL PACKAGE WEIGHT: 158 lbs. This system uses only 10.86 amps of 27.5 volts dc.

Heavy Twin-Engine System

COMMUNICATIONS: 880-channel, crystal-controlled 51X-2 VHF receiver, 10.5 lbs.; 680-channel, crystal-controlled, 25-watt 17L-7 VHF transmitter, 14 lbs. STANDBY COMMUNICATIONS: 680-channel 17L-7, 14 lbs. NAVIGATION NUMBER 1: 51X-2 VOR/LOC receiver, 10.5 lbs.; 344B-1 omni-converter, servo amplifier, OBI, 13 lbs.; 332C-1 RMI dual pointer (ADF and 344B-1), 2 lbs. NAVIGATION NUMBER 2: 51X-2 VOR/LOC receiver, 10.5 lbs.; 344A-1 omni-converter, servo amplifier, OBI, 9 lbs.; 331H-1 course selector indicator, 3.2 lbs. AUTOMATIC DIRECTION FINDER: DF-201 ADF including antenna, receiver, control, 2 lbs. INSTRUMENT LANDING SYSTEM: 10-channel 51V-3 glideslope receiver, 6.4 lbs.; 3-light 51Z-2 marker beacon receiver, 4.9 lbs. COMPASS: MC-102 gyro compass including gyro, flux detector, amplifier and slave indicator, 14.3 lbs. AUTOPILOT: AP-101 autopilot system including FD-104 Flight Director, controls, instruments, servo controls, vertical gyro, computer and computer amplifier, 130 lbs. PASSENGER ADDRESS SYSTEM: 346D-1 passenger address amplifier, 9.6 lbs. INTERPHONE: 346A-1 interphone ampli-

Collins Radio's new 30-lb. DF-201 ADF covers 90-1,800-kc. range with three-knob digital frequency presentation. Control (left) measures 5.7 by 4.5 ins. Modular construction features 51Y-1 receiver (below) in ½ ATR case. Use of 13 transistors and 7 diodes reduced number of tubes to 8 and slashed power requirements. A 332C-1 RMI unit (right) and a flush-mounted 137A-1 directional antenna are used with it.



fier, 6 lbs. WEATHER RADAR: WP-101 radar including indicator, control synchronizer, RT unit and antenna, 122.8 lbs. TOTAL WEIGHT OF PACKAGE: 411.5 lbs.

Collins is also engineering special pre-fabricated racks for twin-engine business planes, featuring complete wiring for plug-in installations and aimed at standardization to conserve space and weight.

"The basic philosophy behind all our new lightweight systems is to provide high quality performance and increased reliability in a smaller package," Flynn said.

We visited Collins facilities in Cedar Rapids, Iowa, with Flynn to see the new units in the engineering laboratories, on the production lines and in the testing department. It was a sight we never expected to see — lightplane electronic gear and airline-big plane equipments side by side, both receiving the same thoroughness all the way through the Collins process.

In the engineering laboratories we learned how it was possible to slash weight as much as 60 per cent to achieve the new lightweight goals. This was accomplished with new, lighter, thoroughly-tested and proven components — with smaller assemblies made possible by power-saving circuitry and the resultant decrease in heat output. In some units, functions previously requiring two or more components have been combined in one while maintaining the original weight of a single unit. Modular design eliminates wasted space. Transistors reduce power requirements and lower voltages make possible smaller transformers, tubes and similar parts.

Paul McKinley, head of Collins' Airborne Systems Group, gave us a good example illustrating the accomplishments involved by comparing the new VOR system, 51X-2/344B, with the old 51R-3. The new 51X-2/344B effects a 35% reduction in size, 45% reduction in weight, 55% reduction in power required and 30% reduction in power density.

This example provides an index to increased reliability because it shows how operating temperatures, or heat density, have been reduced — actual research and test records have proved that equipment failures are greatly reduced by lower operating temperatures.

This was expressed another way by Paul Wulfsberg, assistant director of the Research and Development Division at Cedar Rapids. Each increment of 10 degrees centigrade in reducing operating temperature doubles component life and the 51X-2 receiver operates 15 to 20 degrees C. cooler than its predecessor model. Component life therefore has been greatly increased. Heat reducing tube shields are used by Collins and they just about double tube life. Collins derates some of the components it uses to achieve greater reliability. For example, 500-volt capacitors are worked in receiver application at a maximum of only 130 volts to quadruple their life.

Aircraft radio and electronics equipment must meet high standards of service at Collins, whether it is the new lightplane gear or airline equipment. Mechanical drives, for example, have been simplified and have more "beef" for strength and greater reserve. Switches are the same, identical ones used in larger, more costly equipment — they are of solid coin silver instead of plated brass. Crystals are the same, the finest Collins can obtain; ditto for wire; the same ARINC tubes are used — and so it goes. The same TSO requirements are met.

Reliability is a hallmark at Collins, which has published a complete book to detail its methods of achievement. Indeed, the company was built on its success in meeting difficult requirements imposed by the airlines as its major customers. Apart from the dominant factor of protecting lives of passengers under all conditions, reliability pays off by reducing maintenance costs, reducing spare parts and reducing the need for back-up equipment. Hence the visitor to Collins finds a super abundance of complete facilities for testing and evaluation of all equipments.

Each unit manufactured by Collins is operated for a period of 20 hours — and then retested. Even before manufacture and assembly of complete units, everything that goes into Collins equipment must pass rigid requirements in design, materials and operation. Every test known to the industry is used. From original design, the emphasis is on the most simple circuitry possible, the least practical number of components, adequate design and performance tolerances, controlled environmental conditions and ease of maintenance and repair.

We got the impression at Cedar Rapids that nobody in aviation is more dedicated to air safety than the Collins people. They have a picture which expresses the attitude of Arthur A. Collins — it shows an airplane in flight over a limitless expanse of ocean and bears this motto: "No time for failure."

The new lightweight Collins line was a long time coming from laboratories and production lines always preoccupied with the demands of the most critical and technically qualified of customers. It means the pilots of single-engine lightplanes and small to heavy twins can go all the way for quality in some items now and additional units later without sacrificing payload and space, competing with the airline pilot in matters of operational completeness, reliability for safety, less maintenance and the ability to hear and be heard and to navigate precisely.

Norm Larson (left), Beech distributor in Los Angeles, shows Travel Air to enthusiastic Actress Gale Storm's family.

Travel Air Production Hits Stride

PLACING aircraft of a new model into the hands of anxious customers for the first time is one of the toughest jobs a factory can tackle, as Beech Aircraft Corporation and its distributor-dealers can testify in the case of the brand-new Travel Air, America's latest small twin-engine business plane.

Happy Travel Air owners began receiving their excellent little Beech twins last month in quantity and delivery schedules began smoothing out into a steady flow. But behind the start of volume deliveries was a long,

Boost in business plane orders comes from nationwide open house promotions. Here's scene at Norman Larson's Los Angeles business flying center.

Travel Air and Bonanza production in high gear looked like this at Beech factory last month. The new 200-mph., 4-place Travel Air was being turned out at a rate of 1.1 planes daily. Five for delivery are shown below.

complicated process of readying both the airplane design and its manufacture to meet an expected heavy market demand.

The Travel Air design originated as a flyable airplane when the prototype made its first flight on August 6, 1956, less than 40 days after Beech management approved preliminary design plans and the experimental department began putting the airplane together. Thirty-five days later, a manufacturing plan was approved and commercial engineers eight weeks later finished structural drawings ahead of schedule. That's when, in late November, 1956, the factory men nailed down production schedules calling for the first completed Travel Airs to roll off the assembly lines late in 1957.

Because the Travel Air utilizes so many components from current-production Bonanzas, outsiders might expect little difficulty with its production. But Beech was crowded with orders for Bonanzas, Twin-Bonanzas and Model 18 twins — the problem was to sandwich the new little Travel Air into the crowded complex without upsetting schedules and efficiency. Materials had to be ordered. Stockroom space had to be added — even Plant 2's main building had to be enlarged to obtain additional assembly line area.

Exactly one year to the day after the manufacturing plan had been authorized, the first production model off the line was flown on Sept. 10, 1957. Final CAA airworthiness certification had been completed on June 1, 1957.

(Continued on page 50)

Revolutionary improvements in size and weight reduction by Aircraft Radio Corporation are dramatized by this photo of the old ARN-6 ADF (left) and the new ARC Type 21A ADF (right). Over-all size reduction is 5 to 1 and weight reduction is at least 3 to 1. Note comparative sizes of corresponding receivers, control units and streamlined housings.

ARC--Blue Chip In Electronics

By GEORGE E. HADDAWAY

COMMERCIAL aviation reached an all-time peak in acceptance and utilization last year.

Aviation electronics had a lot to do with this achievement; and when the historians document the coming-of-age of civil aviation during the fabulous fifties, our aviation radio people will receive a fair share of the credit. Right now we're inclined to take these people and their magic working equipment a lot for granted.

One of the blue chip companies in this vital field of aeronautical enterprise is Aircraft Radio Corporation of Boonton, New Jersey. Known throughout the trade simply as ARC, this quality-conscious organization is considerably more than an aircraft radio factory. It is an institution.

ARC started building aviation radio in 1928 and they've been hard at it for thirty long years on the same site. Being practical people they built an airport alongside the little factory and purchased an airplane that first year of business in order to flight-test everything they developed.

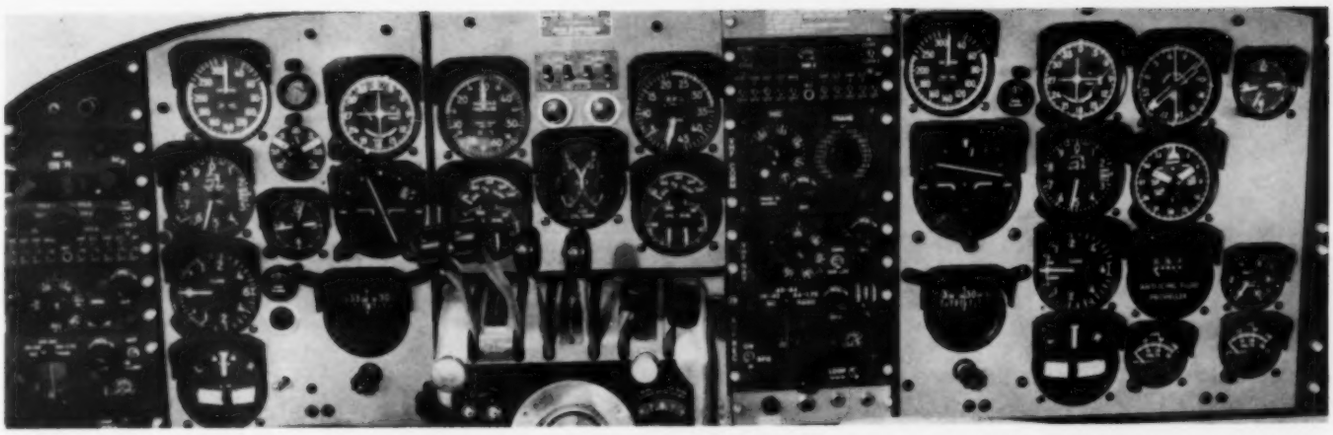
Not very many people in aviation know ARC radios were the first used in the early airmail planes. The first radio beacon receiver, standardized by the Army Air Corps, was ARC. Jim Doolittle used ARC on the first recorded blind landing. And the first airborne voice radio adopted as standard by both the Air Corps and the Navy was ARC equipment. Throughout the 1930's and through the end of World War II the company was a major supplier to the military services.

Only recently did ARC become a substantial factor in commercial aviation radio. In the first few lean years after World War II they started serious engineering on a commercial line. But Korea came along to reinstate them as a purely military supplier. Following Korea they started commercial development once again and their commercial lines began to show up in executive and airline aircraft about 1954. That was the year ARC let the competition know they were staking a claim on a fair share of the fruitful commercial market. Sales in 1955 were three times 1954 deliveries. Likewise 1956 business almost doubled 1955. Commercial business for the past two years accounts for approximately forty per cent of ARC's total output. This is an amazing transition from total military to a healthy commercial balance.

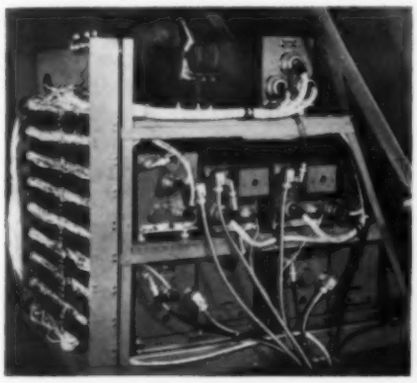
Successful miniaturization of ARC's 21A ADF earned the firm a certificate of excellence at the recent First Annual Miniaturization Awards Dinner in New York. John A. Doremus (right) of ARC is shown accepting it.

Last month's visit to the ARC factory near Boonton was our first although we had seen it from the air several times, nestled in the picturesque North Jersey verdant rolling country of woods and running streams, off the beaten track yet only 25 miles from New York City. There are not many airports you can call beautiful. But this one qualifies for that adjective. Quipsters have referred to it as the ARC "Country Club" and it does have a country club peace and beauty about the place, even in spite of the mantle of snow that greeted us on arrival.

Three factors stimulated the urge to visit ARC and find this story. First, the tremendous loyalty so obvious among ARC customers, especially in the executive flying field; second, our observation of rarely ever seeing secondhand ARC equipment on the market; and third, the rapidity with which they moved into the quality commer-



The ARC Twin-Bonanza has a panel (above) featuring complete dualization of communication and navigation facilities. Compact baggage compartment installation is at left below, while pretty Shirley Knobel holds one of the 12.2-lb. 360-channel ARC transceivers. On the panel above, dual communications are on the left, dual navigation to the right of the engine cluster. Included are ARC Type 210, ARC T-20 and associated R-19 receiver for VHF communications; ARC 15-E omni; ARC 21A ADF; ARC R-20A marker beacon and ARC F-13A speaker amplifier. In the baggage rack, two VOR receivers are on the bottom shelf, two ADF's and R-19 receiver on middle shelf and isolation amplifier and speaker amplifier at top. Other units are on lower shelves behind forward units.



cial airborne equipment field after having been exclusively a supplier to Uncle Sam.

So it didn't take much urging from commercial sales manager H. S. Christensen, known throughout the country as "Mr. ARC," to get us into Boonton after we had expressed a desire to look the place over.

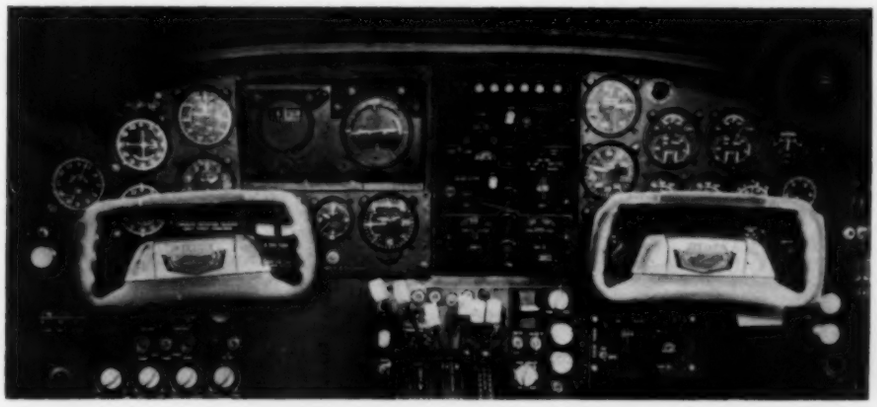
We spent an entire day peering into every nook and cranny of the spotlessly clean factory. It was quite clear why ARC is synonymous with quality — true perfectionists of the old school. Quality is their credo. We learned with amazement that for every one dollar spent on production, one dollar and forty cents is spent on testing! They carry some 60,000 individual parts on their Kardex file. Over 90 per cent of these are processed from raw materials in the ARC plant. Why? In order to get the standard of quality they require.

The chemical laboratory with anodizing and plating equipment, for example, treats everything they make. Every connector is gold plated! Plating eliminates the need for fungicide preparations. Every ceramic piece is double silicone dipped and heat treated.

Inspection begins the minute incoming materials are received and never ceases until the customer takes

(Continued on page 60)

The new and compact ARC centralized system control panel at left is pictured in a Cessna 310B at right and is available for all types of aircraft. It provides edge-lighted control of dual omni, course director, dual communications, ADF, marker beacon, glideslope, audio and speaker amplifier.



Cessna's Big-Sell Moves More Airplanes

New airplane glitter in a gaily-decorated hangar showing — that's the formula Cessna dealers everywhere used to launch the new Cessna 175. *Photo above shows the scene at Skyways, Inc., Portland-Troutdale Airport in Oregon. These dealer showings were preceded in Wichita by delivery (below) of over* 200 *new Cessnas to dealers.*

IF heavy promotional efforts and the so-called "hard-sell" technique ever need proof that they can produce results when it comes to moving aviation merchandise, that proof can be furnished by Cessna Aircraft Company's current success in moving business airplanes out of its Wichita factory into all sections of the country. While recession talk grew in volume in other industries, Cessna's prosperous merchandisers delivered 242 airplanes in January, 208 in February, 310 in March and expected to deliver over 300 again in April for a total of over 1,000 business-plane deliveries during the first four months of 1958.

Cessna's March deliveries brought it the largest dollar volume of business-plane sales in its 31-year history. Del Roskam, commercial manager, reports the company. has already logged a 20-per cent increase during the first six months of its 1958 fiscal year and expects to average 25 per cent more sales for 1958 than for 1957.

Frank Martin, marketing manager, says, "We are selling acceptance and only through a concentrated effort on the part of the industry to convince more people that a business airplane is the best means of travel will the industry continue a healthy growth

pattern year after year."

With the largest promotion budget in the business aircraft field, Cessna has been beating the salesmanship drums long and loud in an all-out drive to acquire and then sustain 50 per cent of the industry's total sales. One of its favorite and hardest-worked efforts is the promotion of local dealer "open house" shows. In these, dealers campaign to attract public gatherings to their showrooms with hangars on the airport, having previously engaged in painted-up, fixed-up, dressed-up and decorated-up programs to surround newest Cessna models with all possible sales appeal.

This type of selling can not succeed with a once-a-year flourish — it has to be a continuing promotional effort with periodic build-ups. Cessna provides the stimulants, chiefly by making a big show with each of its numerous models, new versions of which are introduced separately through the fall and spring.

The latest example of this occurred on March 26 when over 500 dealers and local newspaper-radio representatives were gathered into Wichita to launch the firm's nationwide presentation of the new 4-place Model 175.

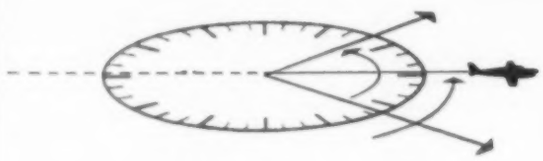
(Continued on page 50)

Airplanes by Cessna, pleasure boats by Chris Craft, station wagons and sports cars by Chevrolet — that's the setting in which Yingling Aircraft at Wichita presented its new Cessnas. Note use of store window models and luggage. High sales appeal coupled new Cessnas with more familiar travel equipment in attractive display to stimulate more public interest.

Install the *NEW*, powerful...

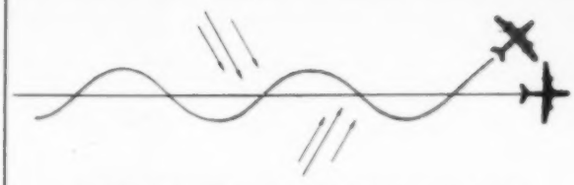
LEAR SUPER

Here's what Super Arcon does:



HOLDS HEADINGS

Super Arcon takes the work out of flying! Navigation now simple because your plane holds headings to better than 1° per minute.



REDUCES AIR SICKNESS

Perfect yaw damping eliminates "tail waggle" in rough air, greatly increasing flight enjoyment for everyone.

ENDS GRAVEYARD SPIRAL

Super Arcon may only save your life, with it any pilot can make a 180° turn safely.

TWIN ENGINE "MUST"

Single engine failures need never be fatal! Even during take-off and landings the alert Super Arcon instantly applies strong counter-acting rudder force to keep the ship straight.

AN IFR PILOT CLAIMS

"...Super Arcon makes IFR flights and ILS approaches a cinch..."

WITH SUPER ARCON YOU

Fly Faster...Fly Straighter
Fly Smoother...Fly Easier
...at less cost!

*The Super Arcon can fly any size or

First Full Time Automatic Rudder Control

THE SENSOR is the hermetically sealed, long life, a.c. powered Rate Gyro spinning at 22,000 revolutions per minute.

THE BRAIN is the Super Arcon computer-amplifier and uses **TRANSISTORS** and printed circuits to shape, integrate and amplify the gyro signals to energize the fast-acting servo.

THE MUSCLE is the famous fast-acting, powerful, velvet smooth Lear magnetic clutch Servo—complete with motor-alternator which powers the a.c. Gyro and Amplifier.

RELIABILITY means there is nothing in Super Arcon to stick, corrode, rust or collect dirt, dust or moisture. There are no valves or tiny passages to clog—and no relays to fail. The Rate Gyro and Servo System is use-proven on thousands of military jets—making the Super Arcon the most reliable, simplest and yet the most sophisticated directional and heading hold system.

Convert your old Arcon to a Super Arcon with the new Super amplifier!

FOR DETAILS SEE YOUR DEALER OR WRITE:

LEAR INC.

Learcal Division · *Since 1930—the finest flight equipment*
3171 SOUTH BUNDY DRIVE (DEPT. F) · SANTA MONICA, CALIFORNIA

LC-47

size or type of aircraft-including helicopters!

Relative size of ramp attendants indicate giant size of the first jet-powered 590-mph. DC-8 as it leaves the Douglas Aircraft Company's new $20 million jetliner assembly plant at Long Beach.

—(Douglas Photo.)

Roll-Out For DC-8 Jetliner

THE first of 138 Douglas DC-8 jet airliners ordered by 17 airlines was rolled out of the Douglas Aircraft Company factory at Long Beach, California, last month and will soon begin flight tests.

When deliveries begin and the first DC-8's are placed into scheduled passenger service late next year, the big jet will revolutionize airline travel with cruising speeds up to 590 mph., cruising altitudes above 30,000 ft., passenger loads up to 176 persons and cabin comfort standards never attainable until jet transport becomes a reality.

The DC-8 was designed three years ago. Roll-out of the first airplane came 11 months after the dedication of a new $20,000,000 production facility constructed especially for DC-8 assembly. As of the roll-out date, April 9, Douglas had invested over $200,000,000 in payrolls, engineering, facilities, tooling and material for the DC-8. At $5,000,000 per airplane, the airlines had committed over $675,000,000 in orders.

Thus the latest of a history-making line of "DC" transports — D for Douglas, C for commercial — culminates one of the biggest new product programs ever undertaken by private

Swept design of the big DC-8 is seen below. It will carry up to 176 passengers and as much as 21,615 gallons of fuel at 287,500-lb. gross. Span is 139.7 ft., length 150.5 ft., height 42.3 ft.

—(Douglas Aircraft Photos.)

industry, there being no military bomber, tanker or transport counterpart of the big DC-8. Adding the figures involved, Donald Douglas calls the DC-8 "a billion-dollar expression of faith in the economic future."

Dwarfing all preceding Douglas airliners — DC-3, DC-4, DC-6 and DC-7 — the giant DC-8 will be delivered in four different versions, all of identical dimensions — span 139.7 ft., length 150.5 ft., height 42.3 ft. — but with gross weight ranging from 265,000 to 287,500 lbs. This is more than ten times that of the DC-3 and just about twice that of the big DC-7C.

Four-engine domestic and international versions are being built. Either J-57 or J-75 Pratt & Whitney jets power the domestic versions, while international DC-8's will have either J-75 or Rolls-Royce Conway by-pass engines.

The 265,000-lb. J-57 version will have a maximum cruise speed of 561 mph. at 30,000 ft. and 220,000-lb. gross weight. At the same altitude and weight, the 265,000-lb. and the 287,000-lb. J-75 versions will cruise 589 mph., and the 287,500-lb. Conway version will cruise 591 mph.

CAA field length required at maximum weight will be 9,130 ft., 7,020 ft., 8,410 ft. and 8,470 ft. respectively for the four versions. Maximum range for those conditions are 3,900, 4,100, 4,500 and 4,680 miles respectively. Range from a 6,500-ft. runway, using reduced fuel loads, will be 2,340, 3,710, 3,240 and 3,380 miles respectively. Field length required at maximum landing weight for the four versions are 6,680, 6,630, 6,850 and 6,850 ft., respectively.

Douglas says the DC-8 will be delivered with an original and highly-efficient device to reduce engine noise with no loss of take-off performance. This reduction apparently will make the big jet comparable to the DC-7C in exterior noise measurement.

Coupled with the sound suppressor will be a "thrust brake" to reduce ground roll after landing. It may also be used in flight to reduce flight speed quickly.

Because the DC-8's four engines are mounted on pods beneath the wing, each nacelle is equipped with a "blow-away jet" of air aimed down and ahead to prevent the jet engines from sucking up foreign matter during taxiing, take-off or landing. These jets of air modify or completely nullify the natural vortex on the ground beneath engine air intakes. They are a Douglas innovation.

Main landing gear of the DC-8 is castered so that minimum turning distance is achieved on the ground. These main units are four-wheel bogies.

Cabin windows in the DC-8 are described as being larger than those on the DC-7. This is in contrast to other large jet airliners, such as the Boeing 707, which uses small windows.

The DC-8 also will introduce new interior seating accommodations. Fresh air inlets, call buttons and reading lights are installed on the seatbacks, within easy reach of each passenger. In the restrooms, flushing toilets will be an innovation.

The major cabin comfort improvement, however, will be in noiseproofing. Interior quietness never attainable with propeller-driven aircraft will become a reality. Because jet engines are rotary, they eliminate the vibration and beat characteristic of reciprocating engines and their pounding.

DC-8 passengers will not only have hours slashed from their travel by cruising speeds exceeding 500 mph., as compared to 300 mph. today, but will ride with much less fatigue from noise and vibration. DC-8 cruising altitudes at 30,000 ft. or more will nearly always be in air much smoother than at lower levels.

The first DC-8 rolled out is not a prototype but a production model from a line on which other DC-8's are rapidly taking shape. The first nine will be used in an accelerated flight test program for CAA airworthiness certification scheduled to be completed before the fall of 1959.

Airlines have ordered DC-8's as follows: Pan American 17, United 40, National 6, KLM 8, Eastern 20, Japan 4, Scandinavian 7, Panagra 4, Swissair 3, Delta 8, TCA 6, Union Aeromaritime 2, Transports Aeriens 2, Olympic 2, Panair do Brasil 4, Trans Caribbean 1 and Alitalia 4 — total 138.

Individual passenger reading lights, ventilation controls, call buttons, oxygen masks and tables are contained in the seatbacks of the DC-8. Note windows, larger than those on DC-7.

—(Douglas Photos.)

Fairchild's first turbine-powered 40-passenger, 300-mph. F-27 airliner is pictured on its first flight on April 15. Behind it in the Fairchild factory are other near-completed F-27's, 93 of which have been ordered to date.
—(Fairchild Photos.)

Fairchild Flies First F-27 Propjet

FAIRCHILD Engine and Airplane Corporation flew its first production-model propjet F-27 "Friendship" last month and will start deliveries this summer, maybe as early as June, to local service airlines and corporation business-plane buyers who have ordered 68 F-27's with options for others for a total of 93 of the propjets.

Fourteen airlines and 13 corporate customers await deliveries. Airline orders include West Coast 6; Mackey 2; Piedmont 8 firm, 7 optioned; Bonanza 6 and 6; Quebecair 2; Aerovias Ecuatorianas 1 and 1; Northern Consolidated 3; Aerovias Venezolanas 5 and 3; Wien Alaska 3; Wheeler 2; Pacific 5 and 1; Linea Aeropostal Venezolana 6 and 6, and unannounced airlines 6 and 6. Corporations ordering 13 include Continental Can, General Tire, Butler Aviation, Banco de Mexico, Westinghouse, Ideal Cement, Champion Spark Plug and Kimberly-

(Continued on page 50)

FROM THE TIP OF FLORIDA TO THE TOP OF MAINE

Esso is there . . . at 600 airports! Nowadays, flying's a breeze! One reason: Esso Aviation Dealers. No doubt about it, they're really tops for A-1 service (and those Esso fuels and lubricants are A-1 too!). If you've got an Esso Aviation Credit Card, it's even better . . . you can charge tire and battery service, landing fees, overnight in-transit storage and minor emergency repairs as well as your gasoline, oil and lubrication. Next flight . . . enjoy yourself! Put down where there's an Esso Aviation Dealer.

FREE TO PILOTS! See your nearest Esso Aviation Dealer for a free Flight Sequence Card, containing everything from VHF frequencies for private pilots to traffic control light signals.

ESSO

Distributors took delivery of these new 200-mph. Bellanca Cruisemasters for a mass flyaway recently from Northern Aircraft at Alexandria, Minn. Note new paint stripe in flight view.

Speed and Safety

THERE'S not much new about the 1958 four-place Bellanca Cruisemaster — it is different only because its nose cone and doors are now made of tough but lightweight plastic. But Cruisemaster distributors are finding a steady demand for it and recently flew eight new Cruisemasters away in a mass delivery from their annual sales meeting at the Northern Aircraft factory at Alexandria, Minnesota, 120 miles northwest of Minneapolis.

"We're convinced we have the fastest, safest and best-performing single-engine 4-place airplane in the $15,000-$20,000 price range, and so are our customers," says E. G. (Slim) Kidwell, the old veteran Kidwell Aviation Company operator of Torrance, Calif., who also serves as Northern's sales manager after 34 years of barnstorming, airline flying, airport operating and aircraft selling.

"Its 230-hp. Continental engine can whip it along at 206 mph., cruise at 196 mph. and get as much as 800 miles in range with it," Slim says. "It has the famous Bellanca handling characteristics which make a good high-performance airplane easy to fly — it stalls out at only 46 mph. It climbs 1,500 feet per minute and has a 22,500-ft. service ceiling. The Cruisemaster is a short-field airplane and is the best-mannered and easiest flying airplane ever built, bar none."

James Miller, up from Plainview, Texas, as assistant sales manager, and Albert J. Spray of S. & W Aviation Sales at Spencer, Iowa, say Bellanca buyers like its performance, safety and ability to operate from small strips.

Slim Kidwell (left) and Jim Miller manage Cruisemaster sales for Northern Aircraft Co. Four-place speedster (below) has Continental 0-470K engine rated at 230 hp. at 2,600 rpm. for 206-mph. top speed, 196-mph. cruise and 1,500-fpm. climb. Cruisemaster stall is low at 46 mph. It has 54-gal. fuel capacity.

marching forward with...

AVIATION

Grumman Gulfstream

The aviation industry and RCA have long been partners in progress. To this partnership, RCA has contributed a wide range of electronic aids that have played important roles in bringing aviation to its present high level of dependability, comfort and safety. A few that have found special application in civil aviation are named here.

RCA Air Traffic Control Transponder (AVQ-60) automatically and instantly enables the traffic control radar to locate and positively identify aircraft within its range. Light in weight and compact, it is designed for airline, business and military use.

RCA Weather Avoidance Radar (AVQ-50) brings the comfort and time-saving features of airborne weather radar to aircraft with power and weight limitations, such as Aero Commander, Twin Bonanza, Beechcraft Super-18.

RCA Storage Display Tube Indicator increases the effectiveness of the display by permitting the reading of the indicator in broad daylight without hood or shielding.

RCA Weather-Mapping Radar (AVQ-10), now used by many of the world's leading airlines, enables the pilot to "see" and evaluate the weather many miles ahead so that he may avoid areas of turbulence. This makes long and costly detours unnecessary, saves time and increases passenger comfort.

RCA Marker Beacon AVR-200 meets the demand for lightness, transistorized design, low power requirement and minimum maintenance. Functions on DC or AC primary, and actually needs less power than any of the three lamps it operates.

Ask for full information with regard to any or all of these items.

RCA

Tmk(s) ®

RADIO CORPORATION of AMERICA

CUSTOM AVIATION EQUIPMENT

11819 W. OLYMPIC BLVD. LOS ANGELES, CAL.

This gyrocopter hasn't flown yet and the picture is artwork, but Raymond Umbaugh expects it to fly at St. Louis by the middle of May. Pusher engine is 180-*hp. Lycoming and airplane rudder eliminates tail rotor. Umbaugh says it will operate from small farm lots, cruise* 100 *mph. and will be stallproof and spinproof.*

New Sky Car Projects

THE long-sought "every-man's" airplane may not resemble widely-used conventional designs at all — it might look like the two machines pictured on this page. Their designers and backers are convinced they have the answers to many problems.

Consider the little 2-place helicopter-looking aircraft at the top of the page, for example. It is nearing completion by the Umbaugh Aircraft Corporation of Ocala, Florida, and is being readied for its first flight in mid-May from Dinkie Field in St. Louis, Missouri. Raymond Umbaugh of the company said a single-seat prototype, with a 55-hp. engine, first flew about a year ago and was so impressive his firm put 26 engineers to the task of coming up with a 2-place model powered by a 180-hp. Lycoming engine.

"This is not a helicopter in the strict sense — it is like an autogiro but without looking at the rotor, you would think it was a conventional airplane such as a Cub judging by the airplane-type control system and the way it handles," says Umbaugh. "We've checked out private pilots in the single-seater version simply by showing them the control movements and giving them a few words about what to expect — it is very easy to fly."

Unlike an airplane, it needs no airport. But it operates as a helicopter only for the first few seconds on take-off, when the rotor is power driven. Once off the ground, the rotor free-wheels and serves only as a rotating wing, forward thrust being supplied solely by the pusher propeller. There is no fixed wing and no tail rotor, a conventional rudder being used to counteract torque. From a very short take-off, it is expected to climb 1,500 fpm. For a no-wind landing, it will have some forward speed — Umbaugh says about 7 miles per hour, this requiring about 10 ft. of roll with the use of wheel brakes. Without power, as in an engine-out emergency, it will be expected to autorotate copter-fashion in a 1,000-fpm descent. "From a height of 1,200 ft., it should have a gliding radius of at least 1 mile diameter," Umbaugh said.

Other design specifications include empty weight of about 800 lbs., gross weight of about 1,300-1,400 lbs., 21-gal. fuel supply for 3 hours endurance, 100-mph. cruising speed and 300-mile range.

"One of this aircraft's most interesting features is that it can not be

(Continued on page 64)

Frank Piasecki's "Sky Car" is also artwork as seen here but its military counterpart is nearing flight test in Philadelphia. Twin engines drive ducted-fan "rotor-props" to support craft on two columns of air.

IT'S HERE NOW...

An All Transistor Autopilot For Your Aircraft

CESSNA 310
installation of
MITCHELL AUTOMATIC PILOT
approved by CAA

The most significant electronic advance in the last 10 years — Now comes to private and business aviation with an all-transistor autopilot system that has won the acclaim of every pilot who has flown it.

CHECK THESE FEATURES . . .

- Light Weight (8.2# installed)
- Simplest Installation
- 3-Directional
- Smoothest & Most Dependable
- One Degree Accuracy
- Low Power Drain—1/10 amp at quiescense
- One year Guarantee
- Low Price: $2425.00—12 Volt unit
  $2625.00—28 Volt Unit

CAA Approved For: Apaches, Bonanzas, Cessnas 172-180-182-310, Navion, Twin Navion, Comanche. (Pending: Twin-Bonanza, Travelair & Aero Commander).

Mitchell Automatic Pilot

Authorized National Distributors • Contact your Dealer for Demonstration

GENERAL AIRCRAFT SUPPLY CORP.
City Airport, Detroit, Michigan

AVIATION SUPPLY CORP.
111 South Franklin St., Tampa, Florida
Municipal Airport, Atlanta, Georgia

THE DON HORN COMPANY
Box 3736, Lamar Station, Memphis, Tennessee

GENERAL AVIATION SUPPLY COMPANY:

Lambert Field
St. Louis, Missouri

Will Rogers Field
Oklahoma City, Oklahoma

Love Field
Dallas, Texas

Sky Harbor Airport
Phoenix, Arizona

Municipal Airport
Houston, Texas

AUTHORIZED
Cessna
SERVICE

These Authorized Stations Feature Flat-Rate Service

The Air-Oasis Co.
2601 E. Spring St.
Long Beach 6, Calif.

Aircraft Sales Company
Meacham Field
Fort Worth, Texas

Champ's Aviation, Inc.
Municipal Airport
El Paso and Lubbock, Texas

Clinton Aviation Company
Stapleton Airfield
Denver, Colorado

Cruse Aviation, Inc.
International Airport
and Clover Field Airport
Houston, Texas

Dal-Tex Aviation, Inc.
Highland Park Airport and Love Field
Dallas, Texas

Hair Flying Service
Harding Field
Baton Rouge, Louisiana

Poelman Aircraft Co.
New Orleans Airport
New Orleans, Louisiana

Ragsdale Flying Service
Municipal Airport
Austin, Texas

Kenneth Starnes Aviation Service
Adams Field
Little Rock, Arkansas

Southwestern Skyways, Inc.
Municipal Airport
Santa Fe, New Mexico
and Ogden, Utah

Sunny South Aircraft Service, Inc.
Broward International Airport
Fort Lauderdale, Florida

Walston Aviation, Inc.
Civic Memorial Airport
East Alton, Illinois

Yingling Aircraft, Inc.
Municipal Airport
Wichita, Kansas

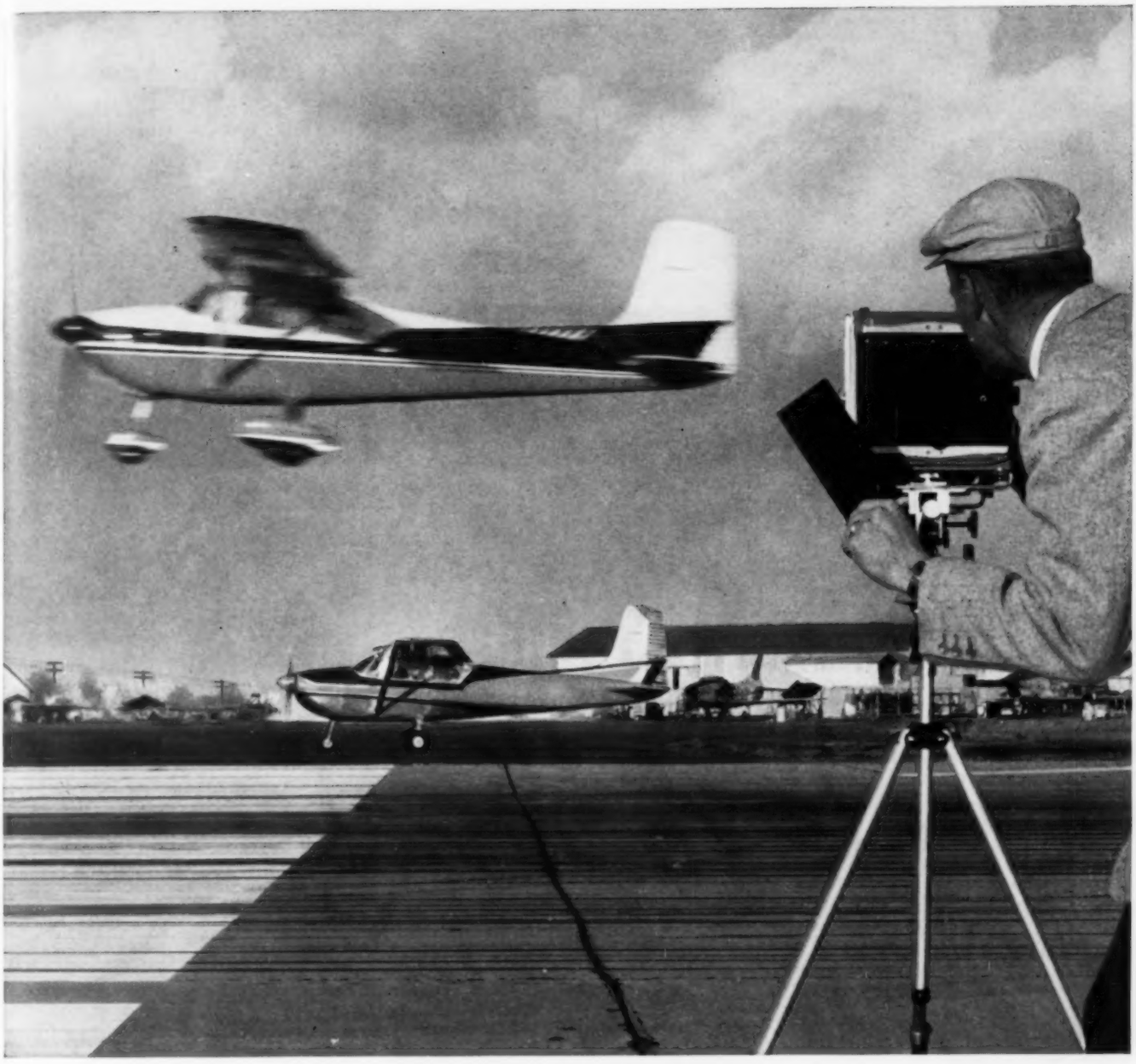
SERVICE SATISFACTION

SMILING SERVICE is what you expect and always receive when our Authorized Cessna Service Stations solve your maintenance needs! We furnish factory skills, factory equipment and factory satisfaction. Cessnas are our specialty . . . and we follow a policy of giving Cessna users a little more, a little better service — LIKE OUR FAMOUS 1-2-3 CESSNA FLAT-RATE SERVICE!

1 You get an accurately quoted price and time-required quotation based on hundreds of job studies covering virtually all maintenance needs.

2 You get genuine Cessna parts and factory-trained workmanship.

3 You save money and time and we stand behind every job for your fullest satisfaction.



It's here! Cessna's new Skylane!

Faster cruising speed and climb, more stability, shorter take-off and landing, 50 more h. p. than others in same price range

A new high-performance Cessna—*completely equipped with radio and navigational gear!* That's the sparkling new SKYLANE!

The SKYLANE also features an over-all Colorama paint job (in your choice of over 500 color combinations), speed fairings, tinted glass in all windows, a magnificently styled interior, and many more extras . . . all yours with the advantages of complete factory installation and "package pricing" of radio and navigational equipment . . .

PLUS the brilliant features of '58 Flair-Flight 182 – new comfort-engineered, 4-place cabin; all-metal construction; Land-O-Matic landing gear; Para-Lift flaps; *6-cylinder, 230-h.p.* Continental engine; greatest stability in its class.

The SKYLANE is truly an exciting addition to Cessna's Mighty Middle Line. Prices begin at $13,850 for the 180 and $14,350 for the 182 (with std. equip.) . . . the de luxe Skylane, $16,850, fully equipped, f.a.f. Wichita. See your nearby Cessna dealer (Yellow Pages of phone book) or write CESSNA AIRCRAFT COMPANY, Dept. FM-25, Wichita, Kansas.

Cessna

Inquire about Cessna lease plans

6 GREAT CESSNAS 172 175 180 182 SKYLANE 310 THE COMPLETE AIR FLEET FOR EVERY BUSINESS NEED

This Belgian single-seater is being marketed in kit form with all components including 30-hp. Volkswagen engine for about $2,800. It lands within 300 ft. at 38 mph., cruises 65 mph., and has a 300-lb. useful load at a 660-lb. gross weight.

European Kit Plane

A low-priced single-seater for the private pilot, available ready-to-fly or as a do-it-yourself kit and priced at about $2,800 as a kit, is being produced at Gosselies, Belgium, by Avions Fairey, S. A., Belgian subsidiary of the well-known British concern, Fairey Aviation Co.

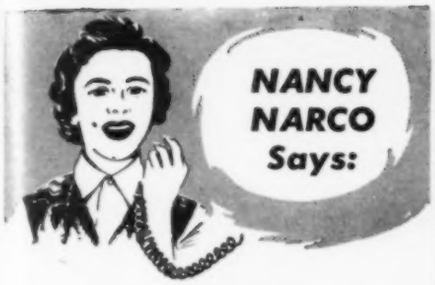
It was designed by E. O. Tips, managing director of Avions Fairey, and is called the "Tipsy Nipper." He says it will cruise at 65 mph. with a range of 187 miles and was designed around a 30 hp. auto engine. It can be towed behind an auto with its wings stowed in a rack atop the car.

It would appear that Mr. Tips and his Tipsy Nipper are in agreement with many in America that the aviation business needs a low-priced kit-type lightplane, economics being such that conventional lightplanes such as the once-cheap Cub type and flying in general have been priced out of the reach of youngsters and adults desiring something less than a full-scale so-called business-type airplane.

The Tips approach was to design the Nipper around a cheap engine — he uses a modified 30-hp. Volkswagen engine mass-produced for small German autos. Fairey Aviation's an-

(Continued on page 60)

Entry step is in metal portion of wing which folds down. Nosewheel is steered with rudder pedals. Shock absorbers on landing gear are rubber rings used on motorcycles. Fuel tank supports instrument panel and windshield attach points. Lower front fuselage panel is a fiberglass molding and gives access to shock absorbers, stick and rudder pedals. Main wheels have disc brakes operated by lever on stick.



STARGAZER

Now that summer's approaching, comes the problem of thunderstorms. Not much need to remind anyone that they ought to be avoided, but here's some information on how they can be avoided which you might not know about.

The nationwide radar network of the Air Defense Command will provide pilots — private, commercial, military alike — with suggested courses to fly which will keep you out of the black stuff. These powerful radars can see thunderstorms for miles around; can see you, too, and give you vectors around the worst stuff.

Here's what you do if you're confronted with electrical storms. Call and listen on the emergency frequency of 121.5 (they prefer you to use 133.2 but you probably don't have it) and say: "Stargazer, this is — Identification, Position, Heading, IFR or VFR, OVER."

Your mention of "Stargazer" automatically means you desire radar advisory service, and you will receive a reply from the nearest ADC radar with instructions, giving headings to follow to avoid the "cells" which contain the worst rain, turbulence, lightning and other vicious elements.

If for any reason they cannot give you assistance, they give it to you straight and simple: "Unable."

If you're IFR, radar will contact ATC for a change in your flight plan if they deem it advisable. If no ATC connections, they'll give you suggested new heading and it's up to you then to contact ATC for a change.

This radar coverage does not blanket the entire United States, especially at low altitudes and in some interior sections, but the total of 93 ADC radars does give effective storm surveillance over wide areas of the country. In addition, of course, there are many Weather Bureau storm detection radars which provide information on thunderstorm activity for inclusion in regular half-hourly weather sequences.

Pilots who have tip-toed around thunderstorms with radar vectoring tell me it's uncanny how radar can give you a really smooth ride. Might file this dope on "Stargazer" in the back of your mind to make your summer XC work a lot easier. One final word, we're reminded by ADC that these radars are there primarily for defense purposes and pilots should use good judgment when requesting assistance.

Regards,

Nancy

NARCO • Fort Washington, Pa.

narco omnigator mk II

More Narco Omnigators are in use in business aircraft, operating IFR and VFR, than any other radio unit. More Narco Omnigators are being built and sold than any other unit of its type.

Pilot confidence and respect, built up over the years for the Omnigator's accuracy, reliability and five-way usefulness, explain this overwhelming choice.

Weighing only 18 pounds, complete with separate power supply, the Omnigator Mk II provides five different navigation and communications functions in a single, space-saving, easily installed unit.

the omnigator mk II helps you 5 ways

1. ILS LOCALIZER for accurate instrument approaches.
2. 27-CHANNEL VHF TRANSMITTER with 5-watt power. 5 mc spread.
3. CRYSTAL-CALIBRATED VHF RECEIVER gives quick, precise Simplex tuning.
4. 75 MC MARKER beacon receiver for ILS, LF range and en route position indication.
5. VOR NAVIGATION. ±2° certified accuracy with large scale course selector.

the perfect pair—dual omnigators

Dual Omnigator Mk II installations are becoming increasingly popular as the perfect answer for dual navigation and communications units for IFR reliability. This combination gives you 54-crystal transmitter capacity with all basic frequencies duplicated, dual VOR, dual ILS localizer, dual 75 mc marker beacon, dual VHF receivers—all at extremely moderate cost, light weight and with traditional Omnigator reliability.

narco NATIONAL AERONAUTICAL CORPORATION
FORT WASHINGTON, PENNSYLVANIA

HERE'S THE SIGN OF THE FINEST SERVICE FOR YOUR PIPER AIRPLANE

Piper has established a world-wide network of Factory-Certified Service Centers to assure you of the finest service possible for your Piper airplane.
To earn the coveted designation, service organizations must meet rigid requirements, must be properly equipped and staffed by personnel who have attended the intensive service school conducted at the Piper plant.
Dozens of Piper Factory-Certified Service Centers have been established throughout the nation and around the world, and more are being designated to assure convenient and competent Piper service wherever you may wish to fly.

FOR THE BEST IN PIPER SERVICE AND MAINTENANCE VISIT THE PIPER FACTORY-CERTIFIED SERVICE CENTERS LISTED BELOW

ANDERSON AVIATION CO., INC.
Sky Harbor Airport
P. O. Box 5175
BRidge 5-5741
Phoenix, Arizona

ATLANTIC AVIATION SERVICE, INC.
Philadelphia International Airport
P. O. Box 5318
SAratoga 6-7500
Philadelphia, Pennsylvania

AVIATION SPECIALTIES COMPANY
Gallup Municipal Airport
P. O. Box 1241
UNion 3-3621 *UNion* 3-5394
Gallup, New Mexico

BROWNING AERIAL SERVICE
Municipal Airport
P. O. Box 1173
HOmstead 5-1728
Austin, Texas

ELLIOTT FLYING SERVICE, INC.
Davenport Municipal Airport
P. O. Box 418
2-2689
Davenport, Iowa

EXECUTIVE AIRMOTIVE, INCORPORATED
Stewart Air Park
P. O. Box 70
GArfield 8-3581, *GArfield* 2-7277
Parkersburg, West Virginia

GREENSBORO-HIGH POINT AIR SERVICE, INC.
Greensboro-High Point Airport
Post Office Box 8237
BRoadway 5-6407, *BRoadway* 5-6408
Greensboro, North Carolina

J & J AIRCRAFT, INC.
Sarasota-Bradenton Airport
821 *General Arnold Road*
ELgin 5-6868
Sarasota, Florida

KEN-MAR AIRPARK, INC.
Ken-Mar Airpark
Box 2667, *University Station*
MUrray 3-6589
Wichita, Kansas

LOUISIANA AIRCRAFT
Downtown Airport
P. O. Box 1428
WAlnut 1-9618
Baton Rouge, Louisiana

OKLAHOMA AIRCRAFT SALES CO.
Ponca City Municipal Airport
P. O. Box 709
ROgers 5-3375
Ponca City, Oklahoma

RED AIRCRAFT SERVICE, INC.
Broward County International Airport, Building 78
JAckson 3-9624
Fort Lauderdale, Florida

SKYMOTIVE, INC.
O'Hare Field, Chicago International Airport
Chicago Telephone NAtional 5-6969
P. O. Box 448, Park Ridge, Illinois

SOUTHERN FLIGHT SERVICE, INC.
Douglas Municipal Airport
P. O. Box 1211
EXchange 9-6374
Charlotte, N. C.

SPARTAN AIRCRAFT COMPANY
Aviation Service Division
Tulsa Municipal Airport
TEmple 5-4491
Tulsa, Oklahoma

ST. LOUIS FLYING SERVICE
Lambert Municipal Airport
Box 6067, *Lambert Field Station*
PErshing 1-0450 & *PErshing* 1-1770
St. Louis, Missouri

PURE PLANE AND PIPER PERFECT

THE ALL-NEW

Comanche

WORLD'S MOST ADVANCED BUSINESS PLANE!

The eagerly-awaited Piper Comanche is now streaking across the nation's skyways. Sleek yet rugged, beautiful beyond compare, the Comanche is today's most advanced business plane.

This roomy, four-passenger, all-metal speed merchant boasts these advanced features . . . laminar-flow wing, jet-type single-piece stabilator and swept rudder . . . so modern, so advanced, yet so docile and easy-to-fly that it sets a whole new concept in aircraft performance, safety, economy, utility.

The Comanche shares the Piper pedigree — latest in the line of world-proven, world-preferred airplanes now being used by thousands of business and professional men, farmers and ranchers. From the rugged Super Cub to the economical Tri-Pacer and the twin-engine Apache, there's a Piper plane that will add to your business — to your pleasure and recreation, too. See your Piper dealer or write for details, Dept. 5-F.

LEARN AS YOU TRAVEL · LEARN ON VACATION

If you are not now a pilot, Piper offers two practical suggestions to simplify learning. Through the famed Piper "Learn as You Travel" program you actually learn while making business trips. Or "Learn on Vacation", either with your local Piper dealer or at a summer resort, many of which have flying schools nearby. In two weeks' time you can be well on your way toward your license. See your Piper dealer for details.

PIPER AIRCRAFT CORPORATION • Lock Haven, Pennsylvania

HERE'S PIPER PERFECTION, TOO

PIPER TRI-PACER. Most popular low-cost, 4-place business plane. Combines most features to simplify flying—tricycle hydrasorb landing gear, simplified controls. Cruises well over 130 mph. Ideal for beginners and experts alike—safe, swift, economical. $8,395.

PIPER APACHE. World's most widely purchased twin-engine executive transport. 4 or 5-place capacity, over 170 mph cruise, up to 1,250-mile range. New reclining chairs, new sound-proofing, big, roomy cabin for luxury travel. Over 40 have flown the Atlantic. $34,990.

Piper also builds the famed Super Cub utility plane and PA-18-A, world's most widely used duster and sprayer.

MORE PEOPLE HAVE BOUGHT PIPERS THAN ANY OTHER PLANE IN THE WORLD

FAIRCHILD F-27

(Continued from page 38)

Clark. West Coast Airlines receives the first F-27.

The 40-passenger high-wing, 300-mph. transport is powered by two Rolls-Royce Darts and is pressurized and air-conditioned. It is produced by Fairchild under license from Fokker Aircraft of Holland. Fairchild Chief Test Pilot Dick Henson, with Co-Pilot Dutch Gelvin, Crew Chief Roy Carter, Electrician Bill Grove and another test pilot, E. W. Hopwood, took the first Fairchild F-27 aloft in a rain at Hagerstown, Maryland, on April 15, after two taxi runs. The first hop lasted 25 mins. 46 secs. "She handled beautifully," Henson said of the F-27.

TRAVEL AIR OUTPUT

(Continued from page 28)

But it was not until November 26, 1957, that the sales department was able to deliver the first Travel Air to a distributor — it had taken ninety days longer to complete an actual delivery than to turn out and fly the first production article. Forty Travel Airs went to distributors before deliveries went to customers, whose advance orders had built up a sizeable backlog.

By February 1, 1958, 300 additional employees had been instructed for individual assignments on humming Travel Air assembly lines. But the characteristic aches and pains of accelerating output on any new airplane had left numerous Travel Airs at a standstill and incomplete — troubles such as new parts development, changes in tooling, manufacturing and engineering, and the addition of newly trained workers. The knots began to unravel when the "off-line" airplanes were shifted from Plant 2 to Plant 1 so that the build-up farther back could continue accelerating.

NEW GRUMMAN AG-CAT crop plane is in production and is being marketed to agricultural operators by distributors including Magnolia Aviation, Laurel, Miss.; Sun Valley Dusting, San Benito, Tex.; United Heckathorn, Richmond, Calif., and Mid-Continent Aerial Sprayers, Hayti, Mo. AG-Cat uses 200-300-hp., grosses 3,600 lbs. with 2,179-lb. empty weight, stalls at 42 mph.

The factory then started hitting its stride — 25 Travel Airs were handed over to flight test in 21 days and the little 4-place, 200-mph. twin was on its way to the customers in quantity. By June 1, Travel Airs can be seen on airports all over America and two were being readied for delivery to customers in Europe — the first Travel Airs to fly across the Atlantic ocean.

CESSNA'S BIG-SELL

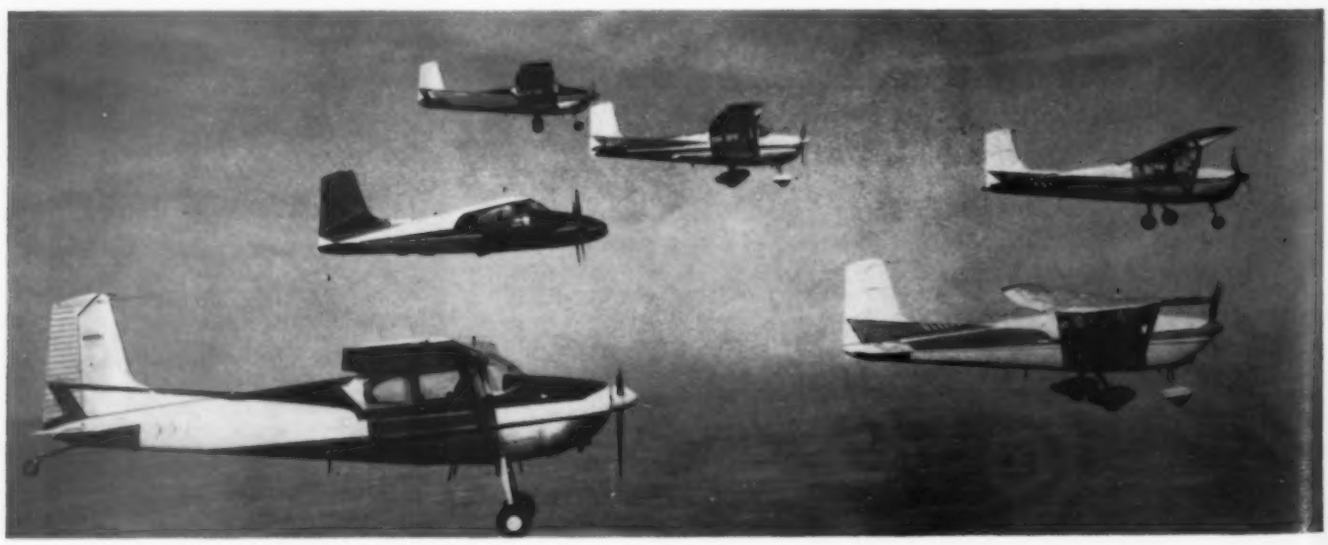
(Continued from page 32)

It took months for this build-up — the dealers were there to pick up 175's they had ordered and which had been accumulated for the big moment, thus creating the biggest mass delivery in general aviation history with over 200 planes being delivered from the factory — and they brought their local press-radio people along to take home news reports of the venture in preparation for local airport showings by the dealers.

This is the biggest, most productive mass-sales effort ever made in the business airplane industry. If it is sustained by Cessna, the company expects to top $50,000,000 in business-plane billings for 1958. The next big show by Cessna will come early in the fall when it launches its latest new model — the two-place, tricycle-gear Model 150. There are already six different models in its line, ranging in price from $8,995 to $59,950.

Five Cessna distributors passed the million-dollar mark in new plane sales last year, led by Air Oasis of Long Beach, California, which topped two million dollars. Other distributors in the company's "top ten" are Mid-States Aviation, Northbrook, Ill.; Walston Aviation, East Alton, Ill.; Business Aircraft Distributors, Oakland; Sunny South Aircraft, Ft. Lauderdale, Fla.; Cruse Aviation, Houston; Southwestern Skyways, Santa Fe, N. M.; Cannon Aircraft Sales, Charlotte, N. C.; Aircraft Sales, Ft. Worth, and Clinton Aviation, Denver.

Latest flight photo showing Cessna Aircraft's six different models is seen below. Prices range from $8,995 to $59,950. —(Cessna Photo.)



if you plan to GROW . . .

The eight-place *Beechcraft* Super 18
RANGE. . . . up to 1,626 miles nonstop
SPEED. . . . . up to 234 miles per hour

The four-place *Beechcraft* Bonanza
RANGE. . . . up to 1,060 miles nonstop
SPEED. . . . . up to 210 miles per hour

The four-place *Beechcraft* Travel Air
RANGE. . . . . up to 1,410 miles nonstop
SPEED. . . . . up to 209 miles per hour

The six-place *Beechcraft* Twin-Bonanza
RANGE. . . . . up to 1,650 miles nonstop
SPEED. . . . . up to 240 miles per hour

. . . here's <u>your</u> Transportation!

Beechcrafts for '58 — FINEST BUSINESS PLANES BUILT!

more **POWER**

more **SPEED**

more **COMFORT**

more **SAFETY**

To get ahead, to stay ahead, business operations must constantly be streamlined. As your company grows and expands your executives will need to travel further, faster.

It's no mere coincidence that BEECHCRAFTS are the flying businessman's favorite . . . for today's business leader recognizes that higher cruising speeds, longer range, and less "time out" for maintenance enable him to arrive ahead and stay ahead of competition.

The J. D. Reed Company invites you to let us show you how a company-owned BEECHCRAFT can provide your executive staff with complete mobility of action and cut travel time as much as 75%. Call us today to investigate this profitable BEECHCRAFT way of doing business.

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SYMBOL OF HIGHEST STANDARDS

Aircraft Electronics Association

This Association has been formed by leading aircraft radio and electronics sales and service firms which are approved by the Civil Aeronautics Administration and the manufacturers of equipment they sell, install and service. AEA is dedicated to higher standards for equipment and its installation and service in recognition of the growing importance of electronics to aircraft safety, reliability and performance. Now, more than ever, aviation progress demands strict adherence to approved standards for aircraft electronic equipment, installation, servicing, workmanship and skills, test equipment and tools. AEA membership as of April 11, 1958, is listed below.

Insist on Approved Electronics Equipment for Your Airplane

Insist on Approved Installations and Servicing for Your Electronics

CANADA
Malton, Ontario — Technical Enterprises, Ltd.

CALIFORNIA
Burbank — B. H. Aircraft Co.; Qualitron, Inc.
Los Angeles — AiResearch Aviation Radio
San Jose — San Jose Avionics Co.
Santa Monica — Clover Field Radio Supply Co.; Executive Radio & Aircraft Service, Inc.
Van Nuys — Planeservice, Inc.

COLORADO
Denver — Aircraft Radio & Accessory Co., Inc.

CONNECTICUT
New Haven — Usher Aviation Radio

DELAWARE
Wilmington — Atlantic Aviation Corp.

FLORIDA
Lantana — E. Farnell & Co.
Miami Springs — A. R. M. Service Corp.

GEORGIA
Atlanta — Southern Airways Co.

ILLINOIS
Chicago — Butler Aviation
Park Ridge — Skymotive, Inc.
Springfield — Capitol Aviation, Inc.

KANSAS
Wichita — United Airplane Sales, Inc.

LOUISIANA
Shreveport — Currey Sanders Aircraft Co., Inc.

MICHIGAN
Detroit — Anderson Aircraft Radio Co.

MINNESOTA
Minneapolis — Minnesota Airmotive, Inc.

NEW YORK
Lindenhurst — Dot Airtronics
Ronkonkoma — Airmar Radio Service, Inc.

OHIO
Canton — Al Holmes Aircraft Radio Service
Cincinnati — Airborne Communications, Inc.
Swanton — Erie Radio, Inc.

OKLAHOMA
Tulsa — Aerotron Radio Co.

PENNSYLVANIA
Reading — Reading Aviation Service, Inc.

SOUTH CAROLINA
Charleston — Hawthorne Flying Service

TEXAS
Dallas — Associated Radio Service Co.; Executive Aircraft Electronics, Inc.
Houston — Allied Instrument Laboratories; Continental Radio Co., Inc.
San Antonio — Matthews Electronics

WISCONSIN
Milwaukee — Anderson Air Activities; Aviation Radio Co.

NATIONWIDE ROUNDUP:

New Business In the Hangar

OAKLAND AIRMOTIVE, International Airport, Oakland, California, says it has successfully completed structural "fail-safe" tests for pressurization of its recently-announced Lockheed PV-2 "Centaurus" conversion (FLIGHT MAGAZINE, April, 1958). George Bogart, CAA, Los Angeles, witnessed the tests. Pressurization differential is 10,000 ft., making it possible to hold a cabin pressure of 8,000 ft. while flying at 18,000 ft. The test section was modeled from the approximate center of the fuselage and is said to have proved capable of safely withstanding operational pressures of 4.576 lbs. per sq. in. Actual test pressure applied reached 9.1 lbs. per sq. in. maximum, indicating a safety factor of almost 2 to 1. Oakland Airmotive says pressurization would add about $150,000 to the customer's cost for the Centaurus, specifications of which include 280-mph. cruising speed, over 2,000 miles of range and over 10,000 lbs. for useful load. Price without pressurization will average less than $200,000, the firm says. The pressurization approval for the PV-2 is also adaptable to the PV-1 Ventura, Oakland Airmotive reports.

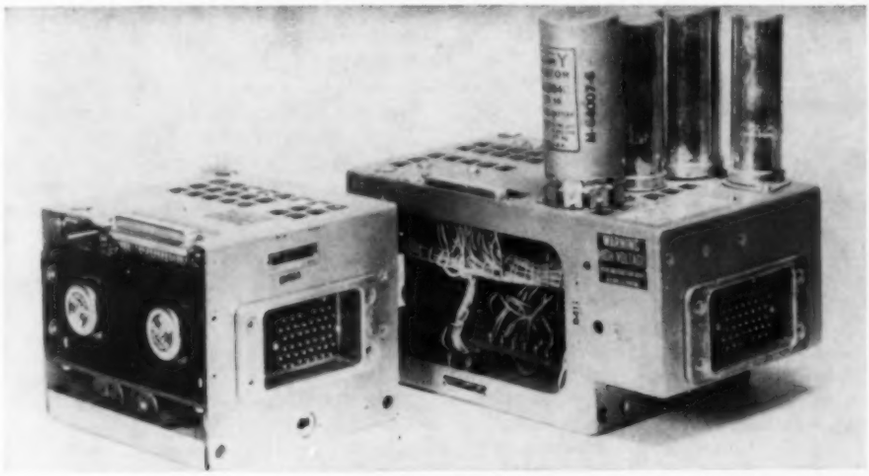
DELAWARE AVIATION CORPORATION, Philadelphia International Airport, has been founded as a new Piper aircraft distributorship for the Philadelphia area. B. D. (Bun) DeWeese, general manager, has had some 25 years of experience as an aircraft distributor, contract flight school director and in aircraft factory sales work. He said Delaware Aviation will operate a complete Piper Certified Service Center with factory-trained mechanics for owners of Piper and other aircraft. Philadelphia International Airport affords modern facilities for business aircraft including a new Airport Motel, coffee shop and dining room, cocktail lounge, drug store, barber shop, limousine and rental car service and a bank.

PACAERO ENGINEERING CORPORATION, Santa Monica Airport, Santa Monica, California, has completed miscellaneous work on Avco Manufacturing's Learstar, Bailey Case, chief pilot, and Hank Inselman, co-pilot. . . . Frank Mills brought in Westinghouse Air Brake's Lodestar for dual engine change, installation of short-stack exhaust system, rudder spring tab system, 100-hr. inspection, electrical re-wire and other modifications. . . . Learstars in for miscellaneous work included Doug Garneau's Utah Construction; Sinclair Refining, Hugh Wells, pilot; Warren Petroleum, Stan Nicola and Bill Reif, pilots, and Lloyd Rondeau's Solo Cup Company.

GREENSBORO-HIGH POINT AIR SERVICE, Greensboro, North Carolina, had J. B. Fuqua's WJBF-TV Apache from Augusta, Georgia, for new paint, custom interior, dual omnis, Wright 90-channel communications and 100-hr. . . . Dual omnis were installed in Andover Aviation's Cessna 195. . . . J. M. Gardner of Gardner Enterprises brought in his Beech 18 for radio work.

AERO ELECTRONICA DE MEXICO, Mexico City International Airport, has been appointed a Narco aviation radio distributor by G. F. Quinby, sales manager. The firm is headed by Manuel Orderica and is fully equipped for radio installation, maintenance and service.

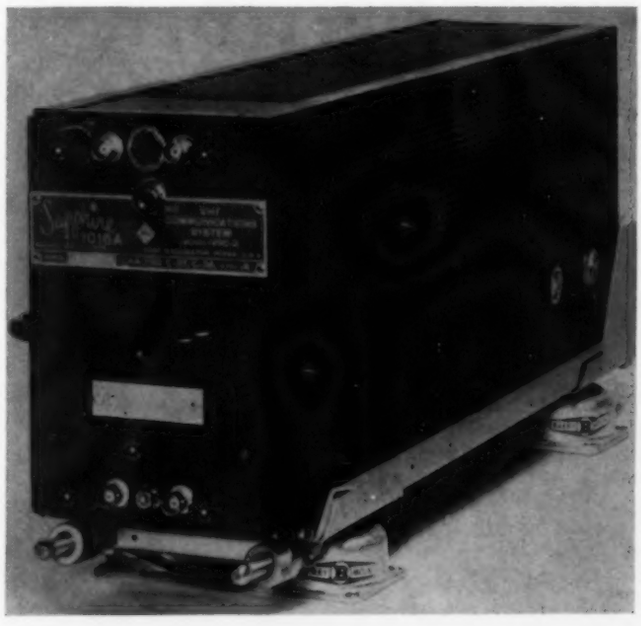
TIMMINS AVIATION, LTD., Mont-

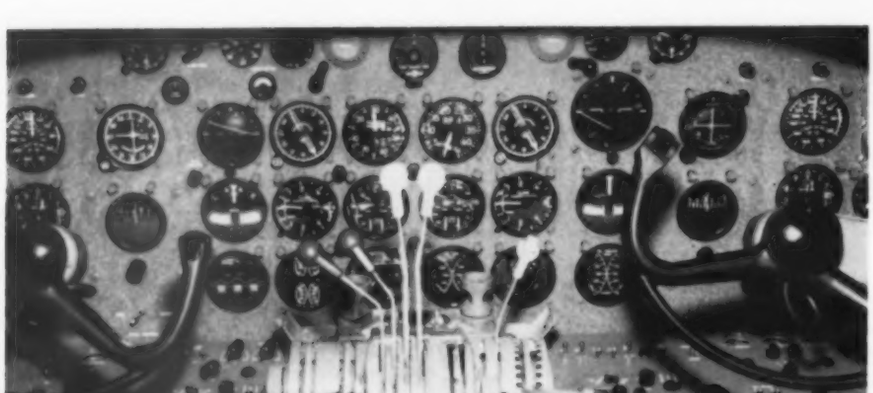


New, compact transistorized power supply of the new Narco Sapphire 1016A transceiver is pictured at left above to show the reduction in size from the old vibrator power supply (right above) used in the original 1016 equipment. New unit saves 4 lbs. in weight, 3 ins. in length and greatly increases efficiency and reliability.

New Improved Narco Sapphire 1016A

National Aeronautical Corp., Ft. Washington, Pa., has a new improved TSO'ed Sapphire 1016A with 90 to 360-channel VHF transmitter, 90 to 560-channel VHF receiver, revolutionary new transistorized power supply unit and many new component and system improvements. It is pictured at right, occupies a ½ ATR rack and weighs 22 lbs. exclusive of antenna and improved panel-mounted selector switches with larger numerals and better lighting. It has a TSO tap for full seven-watt power in scheduled airline use and another tap for 10-12-watt RF output. Actually a package of separate transmitter and receiver units, the 1016A's transmitter uses crystal-saving circuits and gives 50-kc. spacing from 118 to 135.95 mc. and the receiver, with precise 50-kc. tuning, covers 108-135.95 mc. With a VOR/ILS converter such as the Narco VOA-3, it offers crystal-controlled tuning to omni or ILS frequencies. A Narco technological "break-through," the new transistorized power supply reduces the 1016A weight by 4 lbs. over that of the 1016 and greatly increases reliability since there are no moving parts. Narco Sapphires are used by several airlines as well as many business planes.





HOWARD AERO CUSTOM LODESTAR PANEL in the E. W. Brown Lockheed N-212B flown by Henry Messer and Rex Philpott places everything in front of the crew with nothing overhead to reach for. A Bendix radar scope is on the the floor between crew seats. Replete with newest Collins, Bendix and ARC equipment, it also carries a powerful new Collins "ham" set. Howard Aero at San Antonio made the complete conversion in under six weeks, equipping the Lodestar with Wright 1820-72A's for 1,350-hp. for take-off and 240-mph. cruise at 10,000 ft. with 5.5-hr. range.

—(FLIGHT MAGAZINE Photo.)

real Airport, has opened a plush conference room available to flying executives. It can accommodate 100 persons and has complete bar and refrigeration facilities as well as built-in equipment for movie and film slide showings. . . . Timmins recently sold its Trecker Gull demonstrator to Eastern Provincial Airways of Gander, Newfoundland. Provincial's work varies from seal hunting to mercy work and rescue, executive flying and general utility. The Gull will be operated the year-round under severe conditions along the rugged Newfoundland and Labrador coast, logging about 1,000 hours annually. . . . Timmins has acquired manufacturing and distributing rights for the Lakeshore Engine Porter and Tilt-Arc Sling for aircraft engines. Three sizes for engines from the R985 through the R3350 are manufactured and reduce time required for engine change by 60%.

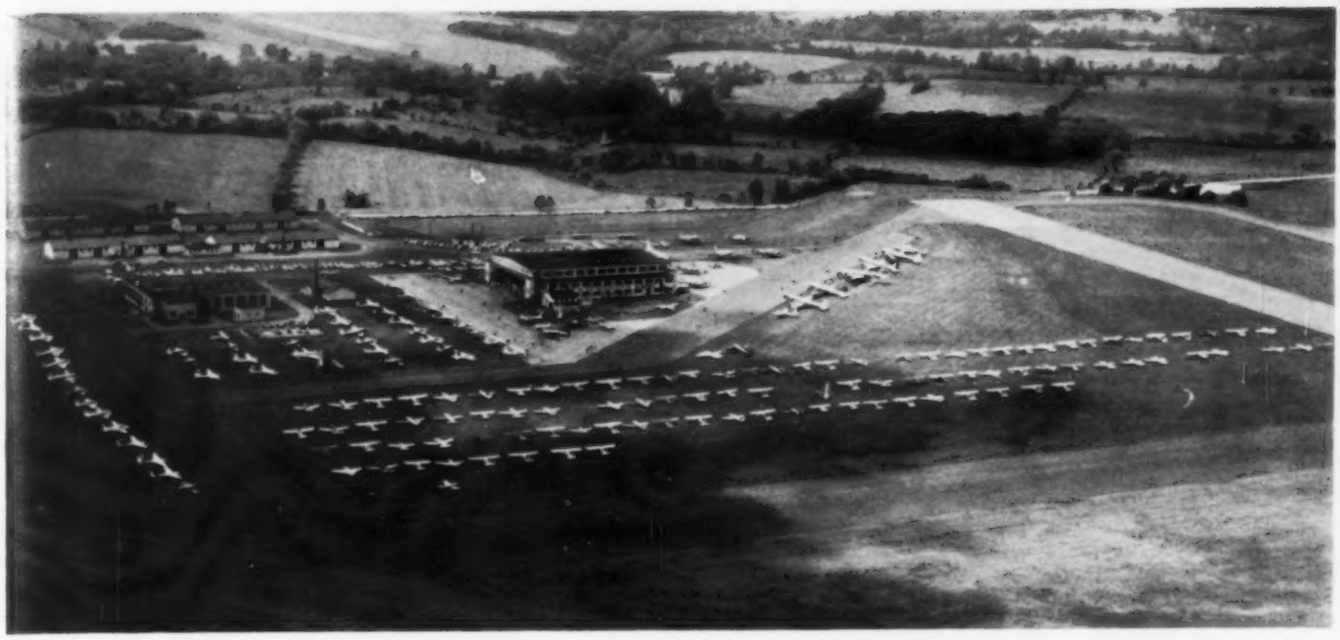
THE GARRETT CORPORATION'S AIRESEARCH AVIATION SERVICE DIVISION, Los Angeles International Airport, has now modified for executive use more than 50 Convair 340 and 440 airliners. Don Neumayer, sales manager, says this figure represents 90% of all Convairs converted to corporate configuration. In addition, AiResearch has modified Convair airliners for Mohawk, Hawaiian and Garuda Indonesian airlines and the CAA. Modifications have included increased passenger capacity, radio operator station installations and installations of gas turbine auxiliary power units on conjunction with radar work. . . . AiResearch last month began installing Bendix RDR-1B radar, Lear C1S-100 flight system and new-type pilot's chairs in Timken Roller Bearing's North American B-25. This airplane, crewed by George Dipple and Jack Dindsvater, is also receiving engine change, 4-color exterior paint job including new Day-Glo rocket-red striping to make it more conspicuous in air traffic. . . . The Die Oxygen Company Twin Beech was brought in by pilot Bob Witter for radio work, miscellaneous modifications, annual relicense and 100-hr. . . . Richfield Oil's DC-3 had AiResearch aileron boost system installed and purchased the Maximizer aileron gap strip kit and exhaust system. . . . Ford Motor's DC-3 was in for AiResearch Maximizer installation including gap strip kit.

SOUTHWEST AIRMOTIVE'S Midwest Division at Kansas City has moved into new quarters, doubling its size, at 420 E. Donovan Road near Fairfax Airport, with Bob Jackson, manager, opening an enlarged CAA-approved instrument and accessory overhaul shop. . . . Southwest's Rocky Mountain Division at Denver has been named distributor for the Friez Instrument Division of Bendix in Colorado, Nevada and Utah. . . . Southwest Airmotive's main base at Love Field in Dallas last month completed a major overhaul and 1,000-hr. inspection on Venezuela Atlantic Refining's Beech 18, brought in by Jessie Reese, pilot. . . . Pilots Bud Clesi and Tink Tinkham brought in their Grumman Mallard of the Vicksburg District Corps of Engineers for minor repairs and double engine change. . . . Others in for miscellaneous work included Larry Montigny's Dresser Industries PV-1, Don Westfall's Aeroquip Aero Commander 680, the Cummins Engine DC-3 crewed by Bill Pruner and Phil Kaulfeld, Keith Winship's Gardner Denver Piper Apache and G. I. Jones' Chalmers-Borton Beech E18.

COCHRAN AVIATION, INC., In-

SUPER CAA AIR ROUTE TRAFFIC CONTROL CENTERS are being constructed to house newest electronic equipment for improved instrument traffic control. Pictured above is a sketch of the new "super center" at Ft. Worth, to be completed in 1959 with over $5,000,000 worth of equipment including long-range radar covering any airplane flying within a radius of 200 miles and radio communications with which a controller can talk personally with any aircraft within 400 miles. The 54,000-sq. ft. air-conditioned center will have 18-in. reinforced concrete walls and ceilings for protection against atomic radiation, emergency sleeping, eating, and water facilities and electronic filter devices. Equipment items include an electronic brain to eliminate manual computation of and reference to flight data. Similar "super ARTC control centers" are being constructed in other areas.

AERO TRACTOR FOR TRICYCLE aircraft. lifts the nosewheel, lowers the tail to clear overhead obstructions, and enables a ramp attendant to move the airplane with simple, foolproof operation. Tractor has 1.75-hp. engine, forward, reverse and neutral controls, parking brake and throttle for speeds up to 3 mph. It is being marketed at $350 by Aero-Vector Corp., Santa Clara, Calif.



TAKE A HEADING FOR READING

Plan Now to Attend the

NINTH ANNUAL MAINTENANCE AND OPERATIONS MEETING

This Year — TWO DAYS, JUNE 6th and 7th

More Spectacular, More Informative Than Ever!

AT READING MUNICIPAL AIRPORT, READING, PA.

1958 PROGRAM FEATURES

FRIDAY, JUNE 6

- United Air Lines Radar School
- Discussion of CAB Draft Release 58.5. Clarification of proposed ruling which will affect everyone flying IFR.
- "Skyways" Round Table:—Aircraft Maintenance. Open discussion of maintenance problems confronting the aircraft operator.
- Leighton Collins:—Instrument Flight in Single Engine Aircraft.
- On Display:—Bell 47G, Republic Alouette II, Vertol C44, Aero Design Alti-Cruiser, Lockheed Jet Star, many other current production aircraft.
- Comprehensive displays by airframe and equipment manufacturers.
- Sailplane Demonstrations by Schweizer.
- Evening Cocktail Party on the lawn.

SATURDAY, JUNE 7

- United Air Lines Radar School.
- Discussion of Aero Design Alti-Cruiser, industry's first pressurized light twin.
- Lee Smith:—Helicopter Maintenance.
- Gill Robb Wilson:—" . . . No title, grade or rank bestows a boon. The man's the thing! . . ."
- D. U. Howard:—Modification of Prior Production Aircraft.
- Howard Piper:—New De-icing Techniques.
- Engine Maintenance and Operations Panel, with full floor participation.
- CAA personnel:—The S.T.C. Program
- Presentation of RAS Awards, with George Haddaway as Master of Ceremonies.
- Naming of "FLAGSHIP" of U. S. Industrial Fleet for 1958.

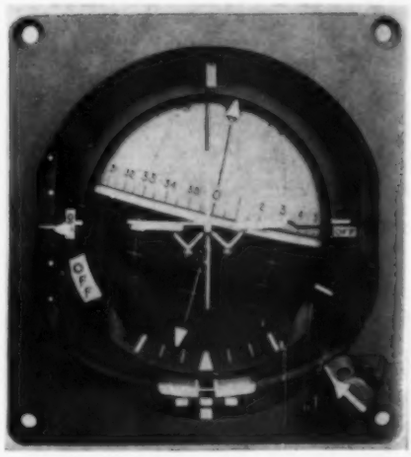
DON'T MISS **. . . aviation's only meeting devoted solely to aircraft owners, pilots, operators**

RAS INCORPORATED

READING AVIATION SERVICE, INC.

Municipal Airport • Reading, Pa. • FRanklin 5-8551

TWO MORE DE HAVILLAND EXECUTIVE HERONS **have been added to** *the British queen's flight, which now has three of the* 13,000-*lb. miniature airliners powered by four* 250-*hp. engines each. Passenger cabins can be converted for either* 8 *passengers in two compartments or* 14 *passengers. Equipment includes* 140-*channel VHF transceiver with* 10-*channel standby, radio compass, ILS and Decca Navigator unit with Flight Log.*



NEW LEAR ASTRA INDICATOR displays aircraft attitude, steering, turn rate and azimuth information with moving-background sphere, fixed symbolic airplane, top and bottom roll pointers, cross pointers, inclinometer tube and ball display and electrical pitch trim and pitch-trim fade. Internal lighting eliminates glare and reflections.

ternational Airport, Oakland, has been appointed Beech Aircraft distributor for Northern California and Northern Nevada by Leddy Greever, Beech vice president-Commercial sales. Cochran occupies the same facilities formerly used by the predecessor Beech distributor, Pacific Aircraft Sales. Principals in the new firm are Joseph W. Cochran, chairman and acting sales manager; George H. Buchner, president and general manager, and Mrs. Cochran, treasurer. Ivar Akselsen, former Beech distributor, will be associated with Cochran as consultant and sales representative. Cochran is well known through his successful auto dealerships and equipment manufacturing activities.

CANADIAN MARCONI COMPANY'S airborne doppler navigation system has been selected by six major international airlines for operational evaluation.

TACTAIR PNEUMATIC T-3 AUTOPILOT installation in the Cessna 310 has been approved by CAA. It is also approved for Bonanzas, Cessna 180, 182 and Skylane and Piper Apache.

EXECUTIVE RADIO AND AIRCRAFT SERVICE, INC., Santa Monica Airport, has been appointed distributor for the complete Wilcox airborne communications and navigation equipment line. Earle V. Gardiner is manager of the firm's electronics department. Executive is a subsidiary of Santa Monica Aviation, sales and service distributor for Aero Commanders on the West Coast.

LAND-AIR, INC., Cheyenne Division, Municipal Airport, Cheyenne, Wyoming, has completed relicensing and installation of a bird-proof windshield on a Douglas B-18 belonging to Mel Christler of Greybull, Wyo. Other major activities since Land-Air's recent certification as a CAA Repair Station included zero-time overhaul and passenger conversion of C-54's for Air-Vietnam and ALA Airlines of Chile, and relicensing of a Douglas A-20 for Combs Aircraft of Denver.

SUNNY SOUTH AIRCRAFT SERVICE, Broward County International Airport, Ft. Lauderdale, Fla., has inaugurated 24-hr. transient line service and Lee Wagener, airport director, has asked CAA to approve 24-hr. control tower service for the field, on which are six aircraft service companies and an airline employing over 200 persons. E. T. Mahood is vice president-general manager of Sunny South.

PIEDMONT AVIATION, INC., Winston-Salem, N. C., reports Reynolds Tobacco's DC-3, flown by Herb Drew, was in for radar installation and miscellaneous work. . . . William Hinton brought in Chrysler Corporation's DC-3 for Janitrol heater, Miner speed cowling and short-stack exhaust system installation and 4,000-hr. inspection. . . . Leo Boyd's Tennessee Eastman DC-3 was in for modified wing fillets and relocation of the alcohol system, and installation of 1830-94 engines with Maximizer cowling and exhaust system. . . . A Tactair autopilot was installed in the Miller Equipment Bonanza. . . . Others in for miscellaneous work included the Virginia State Police Piper Apache, Frank Groat's Hanes Hosiery Mills Beech E18, Thomason Plywood's Beech 18, Karl Styne's Noland Company Lodestar, Studebaker-Packard's DC-3 flown by Bill Abram, Hap Wilson's Management Service DC-3 and the CAA's N-3 DC-3.

C. F. ZIMMERMAN, head of Continental Oil's aviation department, Houston, has been named a director of the National Business Aircraft Association.

THREE DISTRIBUTORS FOR DAY-GLO FLOURESCENT AIRCRAFT PAINT have been named by Switzer Brothers, Inc., Cleveland. They are Larry Zygmunt's General Aircraft Supply Corp., Detroit City Airport; Don Horn Co., Memphis Airport; Skyways, Inc., Portland-Troutdale Airport, Troutdale, Oregon. Day-Glo makes aircraft more conspicuous to other pilots when visibility is normally poorest such as at dawn, dusk and in overcast conditions. Many pilots are having their aircraft striped with generous portions of the markings in Day-Glo, for which a new clear overcoating has been developed.

EXECUTIVE AIRCRAFT SERVICE, Redbird Airport, Dallas, has completed extensive work on Colonel E. W. Estelle's Esso Shipping Convair 340 based at Newark, N. J., which received annual inspection, landing gear overhaul, heater and auxiliary power unit installations, radio work and a new paint job. . . . Russell Purchase brought in a Dow

*BARREL-SHAPED TERRA-TIRES FOR OPERATIONS FROM UNPREPARED TERRAIN are being tested on this Army L-*19 *Cessna Bird Dog by Goodyear Tire and Rubber co. The soft tires permit take-offs and landings on snow, mud, sand, plowed fields and rocky surfaces.*

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To obtain the best service for your Beechcraft and for prompt attention to maintenance and overhaul requirements, visit the Certified Beechcraft Service Stations listed.

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- Logan International Airport
  East Boston, Massachusetts
- International Airport
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Midway Airport, Chicago, Ill.

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Greensboro, North Carolina

ELLIOTT FLYING SERVICE
Municipal Airport, Davenport, Iowa

THE NORMAN LARSON CO.
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Municipal Airport, Houston, Texas

ROSCOE TURNER AERONAUTICAL CORP.
Municipal Airport, Indianapolis, Ind.

TEXAS AVIATION CORPORATION
G. K. Roberts, Pounds Field
Tyler, Texas

TOPEKA AIRCRAFT SALES & SERVICE
Municipal Airport, Topeka, Kansas

TRADEWIND AIRPORT CORP.
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Put Your BEECHCRAFT in BEECHCRAFT Hands

Chemical DC-3, Midland, Mich., for aileron gap cover, radio work, new cabin trim and annual. . . . Ken Hunter received his Kerr-McGee Oil DC-3 with 8,000-hr. inspection, Bendix radar, Barber-Coleman automatic temperature control, complete new electrical system with 200-amp generators and new Baggagemaster door. . . . Cockpit overhead windows were installed in the Gulf Interstate Gas Lodestar from Houston, Barge Pfuehler, captain. . . . Poddy Parish brought in Trinity Drilling's Lodestar for cabin trim and Clint Seccombe was in with Wilshire Oil's Lodestar for miscellaneous work. . . . Cotton Jeter received a new paint job for a Union Producing Beech 18 from Shreveport and Jim Smith's Sid Richardson DC-3 from Ft. Worth received miscellaneous work.

AERO CORPORATION OF ATLANTA, Municipal Airport, Atlanta, performed miscellaneous work on Ralph Witworth's Coca-Cola DC-3. . . . Miscellaneous work was performed on F. A. Caulkins' Goodyear Aircraft DC-3 and a CAA DC-3. . . . A litter installation was engineered for Executive Aircraft Transport's Beech 18 . . . . Radio work was performed for the L-26C Aero Commander used by General Medaris, the missile leader, and two 4th Army L-23 Twin-Bonanzas were repainted.

SKYMOTIVE, INC., O'Hare Field, Chicago, completely re-wired Greenlee Brothers' DC-3. . . . New double cabin windows have been installed in Rhinelander Paper's Beech 18, which received a 1,000-hr. inspection. . . . Pure Oil's Beech 18 was flown in for installation of an Airline Safety performance kit, airstair door and new interior. . . . Essex Wire's Lodestar underwent Pac-Aero's modifications including bat wing and flap-track removal, raising of stabilizer and installation of new fiberglass saddle and intersectional fairings. . . . Bendix X-band radar was installed in International Harvester's DC-3.

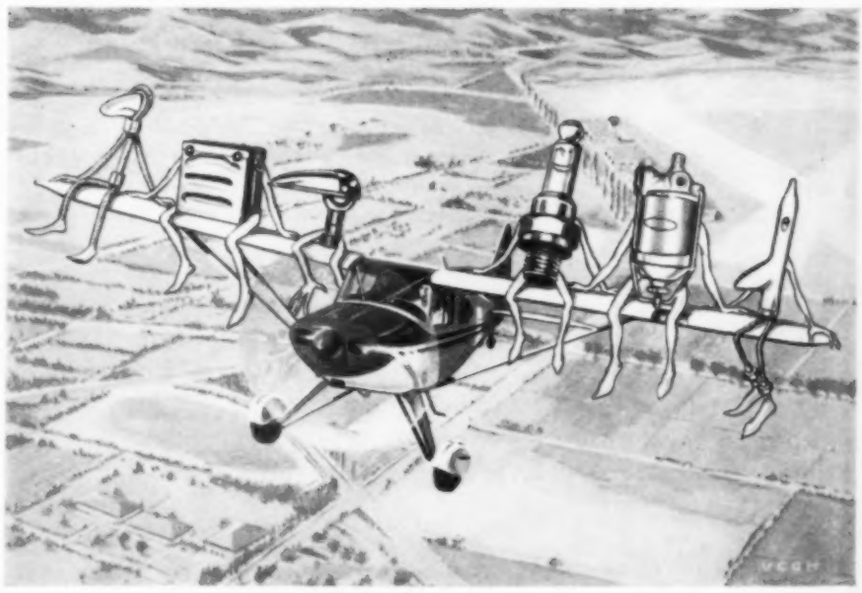
DALLAS AERO SERVICE, Love Field, Dallas, has a complete Speed-Stability-Safety (SSS) kit for Lodestars, completing one early in May for Col. D. Harold Byrd and receiving in April the first of three Sinclair Oil Lodestars from Tulsa to receive the kit. Joe Lacy brought in the first Sinclair Lockheed. In addition to the Dallas Aero SSS kit, it will receive Lear rudder spring tab, Convair wheels and brakes and other modifications. . . . Double engine changes were performed for R. C. Van Buskirk's Denver-Chicago Truck Lines Dove and Paul E. Jones' Shell Oil Dove from Los Angeles. The Shell Oil Dove received complete power-egg double change in only 3 days. . . . Aero Commanders in the shops included J. D. Ferrell's Ibex Company Commander, which received a Federal autopilot installation, and Henry Bird's American Home Realty Commander, double engine change. . . . Progressive 2, and 4 checks were performed on DC 3's from Central Airlines during maintenance strike at its base.

CHAMBERLAIN AVIATION, Municipal Airport, Akron, Ohio, is receiving many inquiries as to the cause and cure for tiny pin holes which appear in radomes — the answers are (a) static electricity discharge causes the holes and (b) only known cure is proper coating of the radome with special black anti-static paint available at Cair (Chamberlain). . . . Cair has obtained over 25 Supplemental Type Certificates (STC's) during the past year and will arrange to make its experiences and capabilities available to other shops as well as performing the work in its own shops for customers from other shops. The list of STC's includes radome kits for Aero Commander, Beech 18's, Douglas B-23, DC-3, DC-4 and Lodestar; Beech 18 airstair door, tail gear doors, auxiliary wing tanks, nose bowl, picture windows, E-18 wing tips, Hartzell 3-blade props, E-18 nose cap and AT-11 floor installation; B-23 wing fillets, pitot and static source, nose radio rack, short stacks, lower cabin floor, cabin chairs, airstep door, S-200 heater and 300-amp. generator; DC-3 pilot seat, and Lodestar static buttons.

"We're Part of the Crew on Every Flight"

Products of Air Associates are found *everywhere*—on military planes, commercial airliners, business aircraft, private planes.

And no wonder. Flyers and those who serve them know they can depend on high quality, fair prices and prompt deliveries when they order from our complete stock of parts and accessories.



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AIR REPORT

(Continued from page 9)

ess than 700 lbs. and is the lightest U. S. aircraft engine ever to achieve 1,650 hp. A helicopter version currently under development has an 1,850-hp. military rating. The Army is considering twin copter turbines in fixed-wing turboprop aircraft in which the shafts from two T55's would lead into a mixer gear box to which the single propeller would be mounted. This configuration would be for maximum-power take-off — while cruising, only one turbine would be operated with the propeller. Such an installation could bring to reality the long-sought ideal of a multi-engine airplane mounting a single nose propeller.

WORLD GLIDING CHAMPIONSHIPS at Leszno, Poland, during June 15-29 will be conducted by teams from 13 countries including the United States, which is sending Stanley W. Smith, Woodland Hills, Calif; Paul F. Bikle of Lancaster, Calif.; Lyle A. Maxey of Downey, Calif., and Francis Compton of South Miami, Fla. They will fly Polish and French sailplanes. With them will be John Aldrich, chief aviation forecaster of the Los Angeles Weather Bureau, and John Graves, also of Los Angeles, manager. Smith is the American soaring champion.

A SIMPLE RADIO MID-AIR COLLISION WARNING DEVICE COSTING LESS THAN $300 has been developed by Bob Brown and Henry Dickhudt, president and vice president of Champion Aircraft at Osceola, Wisconsin, who claim it could be installed in any light and heavy aircraft. Completely transistorized, the light proximity warning device is a transceiver of low amperage and would be automatically turned on with engine starting, air speed register, gear position or throttle position. Termed a "cooperative device," its effectiveness in one aircraft would depend on its installation in other aircraft and ground obstacles such as TV antennas, mountains, etc., all working on the same frequency. In addition to aural, or noise, signals it would include a scanning device and a cockpit instrument to show the direction and approximate distance of other aircraft. A patent application was filed last year and a disclosure made to CAA this year, initial objections being that the device does not make use of pulse or rho theta techniques. It has the deficiency of being unable to "see" directly up or down but it would detect any aircraft approaching from any direction at about its same altitude.

Airmen's Calendar

May 10-14—16th Annual Miami-Havana Air Cruise, sponsored by Florida Air Pilots Assoc. Contact James G. Pace, Cruise Director, 310 SE 2nd Ave., Miami, Fla.

May 16-18—Texas Private Fliers Convention, Baker Hotel, Mineral Wells.

May 21-22—Flight Safety Foundation Regional Business Aircraft Safety Seminar, Palmer House, Chicago.

May 25-31—Aviation Writers Association Convention, Shamrock Hilton, Houston.

May 25—13th Annual Breakfast Flight, Otis Lodge Airport, 8 miles SW of Grand Rapids, Minnesota.

May 28-June 6—1st Annual Circle of the Gulf Air Cruise, sponsored by Florida Aero Club, details from Harry B. Collins, Director, 375 N.E. 154th St., North Miami, Fla.

June 14—Air Mail Pioneers 40th Anniversary Ball, Beverly Hilton Hotel, Beverly Hills, California.

June 14—Texas OX-5 Wing Annual Meeting, Western Hills Inn, between Dallas-Ft. Worth.

June 24-26—31st Meeting, Aviation Distributors and Manufacturers Association, Mt. Washington Hotel, Bretton Woods, N. H.

July 4-6—All-American Aviation Exposition and National History of Flight, featuring antique and home-built aircraft, with Pioneer Airmen's banquet July 5, Pittsburg-Connellsville, Pa. Details from All-American Aviation Exposition, 210 Semple St., Pittsburgh, Pa.

July 5-6—$5,000 Air Race, Fulton, N. Y.

Important WEATHER RADAR news!

PACKAGED RADAR — product of Cair's extensive experience as leading radar installation and service agency — is the result of an efficient new engineering technique that reduces cost and in-process time of weather radar installations. This method features pre-assembly of a Cair radome, with transmitter-receiver, accessory unit and antenna mounted and wired in the radome as shown above. It permits bench-check of the complete system before the aircraft is taken out of service. Saves considerable time and money on installation.

Our experience with the "Packaged Radar" technique enables us to offer standard weather radar systems completely installed on the following aircraft at these low flat-rate prices:

RCA AVQ-50 WEATHER RADAR (Installed Complete)

Douglas DC-3	$12,990.00
Lodestar	$12,990.00
Beechcraft E-18 (Late model)	$12,500.00
Beechcraft D-18 (Including Cair Wing Tanks)	$15,990.00

BENDIX RDR-1B1 WEATHER RADAR (Installed Complete)

Douglas DC-3	$19,990.00
Lodestar	$19,990.00

Prices for radar installation on other aircraft furnished on request. Write for complete details.

Cair

1642A

CHAMBERLAIN AVIATION, INC.

Akron Municipal Airport • Akron 6, Ohio

A guide for buying high altitude Aircraft Oxygen Equipment

The Scott OXYGEN CONSOLE

gives you

DOUBLE DURATION

You can fly twice as long with a Scott Oxygen Console as you can with an "automatic regulator" oxygen system. Prove it to yourself by comparing the duration tables of the various oxygen systems. Scott "Double Duration" gives you twice the safety from the same oxygen supply cylinder.

TAKE THE HIGH ROAD!

More pilots every day are installing oxygen equipment to enjoy the speed, economy, comfort and safety of high altitude flight. When you choose an oxygen system for your aircraft, consider them all. If you do, you'll choose a Scott Oxygen System. Scott offers the most complete line of business, executive airline and military oxygen equipment. You'll find Scott sales, service and recharging facilities are the world's most widely known and respected.

POSITIVE WORRY-FREE OPERATION

You'll be *sure* you're getting all the oxygen you require — no wondering "is it working?" With the Scott altitude gauge you *know* you're getting all the oxygen you need without skimping or without wasting your supply.

THERAPEUTIC OXYGEN AVAILABLE FROM EVERY OUTLET

When you're transporting medical patients or aged passengers, you'll appreciate the Scott System because *each outlet* can provide therapeutic flows... by just plugging in a Scott therapeutic mask connector. If you don't have a therapeutic plug-in you can adjust your regulator 5,000 ft. higher than actual flight altitude to obtain a richer flow.

CONTROL IN EMERGENCIES

With the Scott Oxygen System, you can temporarily "lean out" your oxygen flow to stretch your duration under emergency conditions. Perhaps you have to stay "on top" or go over a mountain at the very time you expected to be letting down. That's when you're glad you have a Scott *controllable* system.

Fill out the easy-to-use prepaid inquiry card in this magazine or write today for complete information!

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KIT PLANE

(Continued from page 46)

nouncement of the Nipper's production and availability says the airframe kit will cost $1,050; the engine with dual ignition will cost $770 or about $490 with single ignition, and the propeller, cowling, instruments, fabric and paint about $140. These items add up to a little less than $2,800 complete, priced at the factory in Belgium. Complete airplanes and kits will be available there by August of this year.

With the Volkswagen engine, here are the Nipper's interesting details:

Gross Wt., lbs.	660
Empty Wt., lbs.	360
Useful Ld., lbs.	300
Top Spd., mph.	75
Cruise Spd., mph.	65
Landing Spd., mph.	38
Take-off Dist., ft.	450
Landing Dist., ft.	300
Range, miles	187
Span, ft.-ins.	19-8
Length, ft.-ins.	14-9
Height, ft.-ins.	5-3
Wing Area, sq. ft.	80.5
Load Factor	7.5

Kit Details

The complete kit is packed in a box measuring 11 ft. 6 ins. by 2 ft. 8 ins. by 2 ft. 4 ins. and weighs less than 400 lbs. for simple transportation overseas. This kit contains (1) the fuselage structure, completely finished, with all brackets and details welded in position; (2) tricycle landing gear, complete, ready for assembly, with hubs, tires and brakes; (3) metal rudder, finished, ready for fabric covering; (4) flight and engine controls and all other metal parts, completely finished, ready for assembly; (5) all bolts, screws, nuts, washers and fasteners; (6) fuel tank, ready for fitting; (7) fiberglass fairings as molded, ready for cutting to final shape; (8) windshield with its fixtures; (9) footstep flap of light metal; (10) a quantity of inspected silver spruce laths for all wooden parts, ready for cutting to size, finishing and glueing; (11) 3-ply sheets; (12) a set of dimensional drawings for all the assemblies and also for the manufacture of the wooden components to be made by the amateur; (13) a brochure with photos and sketches describing and illustrating the building and assembly stages.

ARC-BLUE CHIP

(Continued from page 31)

delivery. As the individual components are finished, they go through additional inspection and testing. When the entire assembly is finished, it, too, is inspected by experts. We saw

"life" test being made on the new Type 210 360-channel VHF set. It was scheduled to undergo 250,000 rapid operations and had already passed the 60,000 mark, or more than five years of actual use. It sounded as though they were trying to destroy the equipment, switching automatically from channel to channel. We readily understood from watching this punishment why they use ball bearings on such equipment. Another torture testing procedure involved heat, cold and humidity. Even after such demanding shake-downs, ARC still flight tests new equipment in their airplane fleet for an entire year before putting it on the market! No wonder you rarely hear of used ARC equipment for sale.

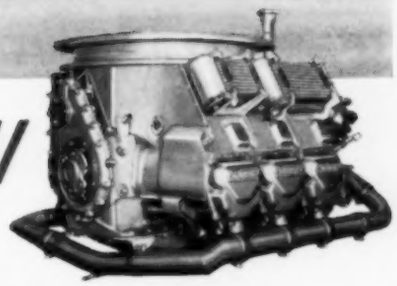
Manufacturing practically everything that goes into their products calls for toolmaking. Their complete machine shop even cuts their own gears. Because of oil in human skin, acid soldering is done by workmen in white gloves. All soldering is done in jigs and not once did we see a gummy solder joint. So complete are their manufacturing processes they do their own silk screening, painting, engraving, and all their printing. It is as self-sufficient a plant as you'll find, depending on outside sources for raw materials, vacuum tubes, resistors and capacitor units only.

In every department you see signs of constant upgrading going on. "How can we make it better?" seems to be a universal goal at ARC.

"Aviation is a three-legged stool," Chris Christensen maintains. "The air-

Typical assembly scene in the ARC factory is pictured by this worker with Type 21A ADF modules, all of which are assembled and tested separately. Note completely hermetically-sealed transformers. Extremely careful checks in production assure successful operation. Each set receives a minimum of 8 hrs. run-in time before final check-out.

30,335 Feet UP!



...CESSNA YH-41 HELICOPTER Sets New World Record, with Continental Power

When Capt. James E. Bowman of the U. S. Army Aviation Board flew the Cessna YH-41 to a new helicopter world altitude record of 30,335 feet, he added another to the long list of major performance records already held by Continental aircraft power. Capt. Bowman's mark, exceeding by some 3,400 feet the previous helicopter record, underscores again the wisdom of engineering the power to its job. The YH-41's Continental FSO526 engine is designed expressly for helicopter use . . . fan-cooled for efficient cooling in submerged installation . . . supercharged for maximum power. Its horizontal configuration permits the engine to be located forward, bringing the load directly below the rotors—an ideal situation in helicopter loading arrangements. Finally, the interchangeability of many parts with those of other models in the Continental aircraft engine line tends to simplify service, and reduce its costs.

Continental Motors Corporation

AIRCRAFT ENGINE DIVISION

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CONTINENTAL IS ON THE MOVE IN 1958

Better Performance
Lower Current Consumption
Greater Reliability
Lighter Weight

DARE DM-3

TRANSISTORIZED MARKER BEACON RECEIVER

A unique transistorized circuit gives the DARE DM-3 tremendous advantages over ordinary marker beacon receivers. All moving parts have been completely eliminated. Dynamotors, vibrators, relays all have given way to the more efficient, more reliable transistors. Result: a sensitive, compact, light-weight receiver you can always rely upon. See it today at your DARE distributor.

Visual-Aural Indication

Operates external 3-light indicator. Simultaneous audible and visual signal with minimum signal input.

Light Weight

Only 5.9 pounds, including power supply. Fits ¼ ATR short length rack. Modular construction for easy servicing.

Sensitive, Crystal-Controlled Circuit

Assures receiving the desired signal without interference from unwanted signals. Requires only 1 ampere at 27.5 volts, or 2 amperes at 13.75 volts.

Meets CAA-TSO C-35 Requirements

DARE INC.
TROY, OHIO

Manufacturers of a Complete Line of Aircraft Communications and Navigation Equipment

plane is one, the engine is another and radio is the third. Only recently has communications and navigation equipment been given equal rank with the airframe and engines. Of the new airplanes the Aero Commander was the first with "eyebrow" installation of radio, the first to make sense in accessibility. The Cessna 310-B was next. Everything we now design is designed with the form factor in mind — the type of mountings to come. It's been a long, tough job to get the equipment in front of the pilot, but we're well on the way."

ARC is working on miniaturization like everyone else — trying to get two components into one package. They are staying with the separate power pack concept so each unit has an independent power supply. This is considered a "must" from a safety standpoint and anything less is compromise. Transistorization is also coming along. In about three months ARC will have a transistorized replacement for dynamotors. We saw evidence of them shooting for a complete ARC quality dual communications and navigation system to weigh 100 pounds or less.

Speaking of miniaturization, the company received national honors in March at the first annual Miniaturization Award dinner in New York. ARC's award was made for its success in design and production of an automatic direction finder which is approximately one-fifth the size and one-third the weight of previous equipment. Little wonder that the ADF is now the "hottest" item in ARC's line of products.

Since ARC is devoted exclusively to airborne equipment — no ground stations, home or other industrial products — it follows that flight-test facilities must be as superb as the test facilities within the plant. ARC doesn't believe in making the customer the guinea pig for its designs. With three airplanes and its own airport it is possible to provide the most extensive possible flight testing before the customer gets the product. This takes longer but there's no doubt about performance on delivery.

An interesting sidelight to the commercial side of ARC business is the fact that they have never designed a piece of commercial equipment that hasn't been purchased "off the shelf" by one of the military services.

Our escort through the engineering department was John A. Doremus, vice president and chief engineer. The facilities include a complete model shop, environmental test and systems test facilities. Each engineer has his

The Propeller Story for '58 . . .

McCauley's out front!

. . . Lighter! Faster! Smoother!

There's a good reason why McCauley propellers are the first choice of so many pilots who'll fly only the best.

New McCauleys—both fixed-pitch and constant-speed—are delivering *more* of what discriminating pilots want from a propeller. Here you see a McCauley Met-L-Prop on the nose of the handsome Piper Comanche. McCauley was specified for this application because it's *lighter*, produces *smoother* engine action and *faster* take-off, climb and cruise.

McCauley propellers are light, yet plenty rugged! With a McCauley you can forget your propeller worries for the life of your plane. It's no wonder that McCauley is the industry's leading supplier of metal propellers for personal and business aircraft. They are available throughout the world.

Specify McCauley!

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Well-known ARC personalities are shown here. Left to right are H. H. Benning, head of quality control; S. A. Meacham, assistant manager of commercial sales, and H. S. Christensen, commercial sales manager. Chris is "Mr. ARC" on airports all over the country.

own laboratory rather than being jammed together as in some factories. The impression here is the same as that gained from the spotlessly clean factory, comparable to a fine hospital laboratory. We saw evidence of the trend toward easy servicing and interchangeable units whereby the same section is used in several equipments. Simply pull out the old box and put in the new. We saw a newly developed protective system for transistors. ARC engineers have made the first forward advance in plugs and wire removal we've seen in years. Other developmental work was a new glideslope receiver and an AC version of the popular ARC Course Director. Another development item is a 3-light marker beacon receiver.

ARC's eighty-three direct factory dealers are never caught with a superseded piece of equipment on their shelves as they are advised well in advance of new models. The company has a strict policy that dealers must sell at list price where this policy is not in conflict with state laws. This, says Chris Christensen, makes for an honest profit which in turn provides a strong and loyal dealer group.

Aircraft Radio's plans for the next few years call for an expansion of its line of equipments, all meeting CAA technical standards orders (TSO's). This includes a continuing expansion of present engineering and manufacturing staff and facilities.

"Expansion for expansion's sake," president William F. Cassedy, Jr., told us, "without regard to quality of product, or continuity of effort in meeting customers' requirements, is not considered good business." He pointed out that the planned rate of increase in ARC's sales is being exceeded. Sales in 1957 were $10.2 million, and are expected to be approximately $12 million in 1958. ★ ★ ★

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"THE GULF COAST'S FINEST HOTEL FOR THE FINEST CLIENTELE"

Unexcelled accommodations — air-conditioned throughout. Finest foods served in Dining Room and Coffee Shop. 600 acres devoted to outdoor recreation—private 18-hole championship golf course, swimming pool, tennis courts, salt and fresh water fishing. Playground and wading pool for children. Open all year. Moderate Rates.
Special Rates for Families with Children (Under 14 Years of Age) No charge for children when they occupy the same room with their parents. (Extra beds will be provided). If a separate room is required the single rate will apply for the room occupied by the children.

IDEAL CONVENTION, MEETING & BANQUET FACILITIES.

EDGEWATER PARK, MISSISSIPPI

Overlooking The Gulf of Mexico midway between Gulfport & Biloxi

clip and mail this to start you on your greatest Gulf Holiday

Name_____
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PLEASE SEND ME YOUR LITERATURE AND RATES

AT ASSOCIATED RADIO

We Deliver

When others promise

Pilots and planes differ in equipment needs — no "standard" aircraft radio installation can serve everybody efficiently.

Custom avionics at ASSOCIATED RADIO is the practical solution to specialized needs — we have the right answer with expert engineering, design, performance and servicing.

There's something new and useful to you in everything we do and we have the latest developments in our large stock of Sperry, Collins, RCA, ARC, Dare, McMillan, Comco, Flite-Tronics, Sun-Air and Electro-Voice equipment.

If yours is a special problem, bring it to ASSOCIATED RADIO for satisfaction.

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CUSTOM LOVE FIELD DESIGN
DALLAS

FLeetwood 7-2891
We are CAA Repair Station No. 3664, Radio Class 1, 2, DME and Limited Radar.

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. . . to over 30 cities in six states with connections to cities throughout the nation.

Anywhere you go in Texas, Oklahoma, Arkansas, Kansas, Colorado and Missouri, Central Airlines will be happy to help you bank your time for future use.

You will earn extra dividends in pleasure and economy when you use Central Airlines' FAMILY PLAN . . . the whole family can fly with you . . . at reasonable cost Monday noon through Thursday noon.

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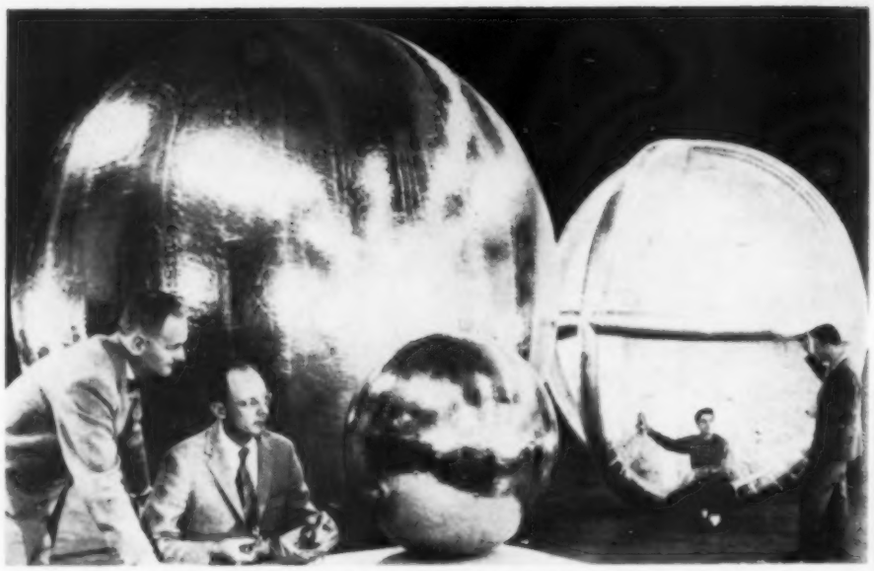

INFLATABLE ALUMINUM-FOIL SATELLITES to be launched into space this year include 30-in. sphere on table, 12-ft. balloon behind table and 12-ft. "corner reflector" at right rear. Sphere's designer, W. J. O'Sullivan of NACA (seated) holds collapsed 30-in. sphere, made of 65 cents worth of Reynolds aluminum foil. All three objects are launched in collapsed form, inflated in outer space. Twelve-foot balloons will gleam as brightly as the North Star and corner reflector satellite will reflect radar waves as navigation aid once it is orbited. —(NACA Photo.)

SKY CAR PROJECTS

(Continued from page 42)

stalled and will not spin," says Umbaugh. "If the angle is too steep, it simply settles gently and is controllable all the way."

Umbaugh expects to be able to produce the 2-place machine in quantity and sell it for less than $10,000 per copy, complete. He said the design and his plans for producing it resulted from his experiences in the large-scale selling of farm fertilizer and chemicals, which his company manufactures. He has salesmen calling on farmers. They began using 3-place Bell helicopters to make more calls and sales per day by flying right into the farmers' lots instead of using autos. The copters increased sales so impressively Umbaugh wants to put 100 salesmen into the field in 100 aircraft which need no airports. Rather than buy 100 helicopters, he is undertaking to perfect and produce his own special-purpose aircraft — and market them, too. Could be, says he, the farmers will buy the aircraft, too — they should make good aerial applicators as well as good utility travel vehicles for hopping around the countryside away from airports.

Piasecki Sky Car

The flat-bed auto-like flying machine pictured with this article is Frank Piasecki's idea of what the ideal flying auto should be. Helicopter Pioneer Piasecki's company at Philadelphia is nearing completion of a similar research aircraft for the Army and is scheduled to begin flight tests soon.

"We have definite plans to modify the Army design for civilian use as soon as we fill Army requirements and we have named our civilian design the Sky Car," Piasecki says. He explains

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FIRST OF NINETEEN DE HAVILLAND COMET 4 JETLINERS for BOAC was rolled out of the de Havilland factory at Hatfield, England, last month. Comet 4 is powered by four Rolls-Royce Avon jets, each of 10,500 lbs. thrust, fitted with new Rolls-Royce noise suppressors. De Havilland is also producing Comet 4's at its Chester factory and is building six 4B's for British European Airways as well as the 19 for BOAC.

— (de Havilland Photo.)

that it will be powered by two horizontal 3-blade rotor-props or ducted fans, one at the front and one at the rear with the 4-place cabin between them. These fans will support the craft on two columns of air for vertical take-off or landing or 100-mph. cruising. It will have two engines and will hover on either one. Wheels will be powered for driving on the ground, in and out of garages and parking lots.

"Because it eliminates the helicopter's overhead rotors, it will fly down narrow streets, between buildings and under bridges and wires with complete safety," says Piasecki. "It is designed primarily to fly within sight of the ground, although it will be capable of crossing mountains — this will eliminate the need for complicated navigation systems and enable the driver to follow normal highway markings."

Piasecki says he has already begun airworthiness certification procedures with the CAA.

HANDY MINIATURE FLIGHT COMPUTER is being produced as money clip (above), keychain and cigaret lighter by Beckwith Manufacturing Co., Los Angeles, for Caidquan, Inc., New York and Gardena, Calif.

As early as 1483, Leonardo Da Vinci, before turning his attention to serious painting, conceived and sketched several flying devices. This ornithopter design is from one of his drawings as it might have looked had it been able to fly.

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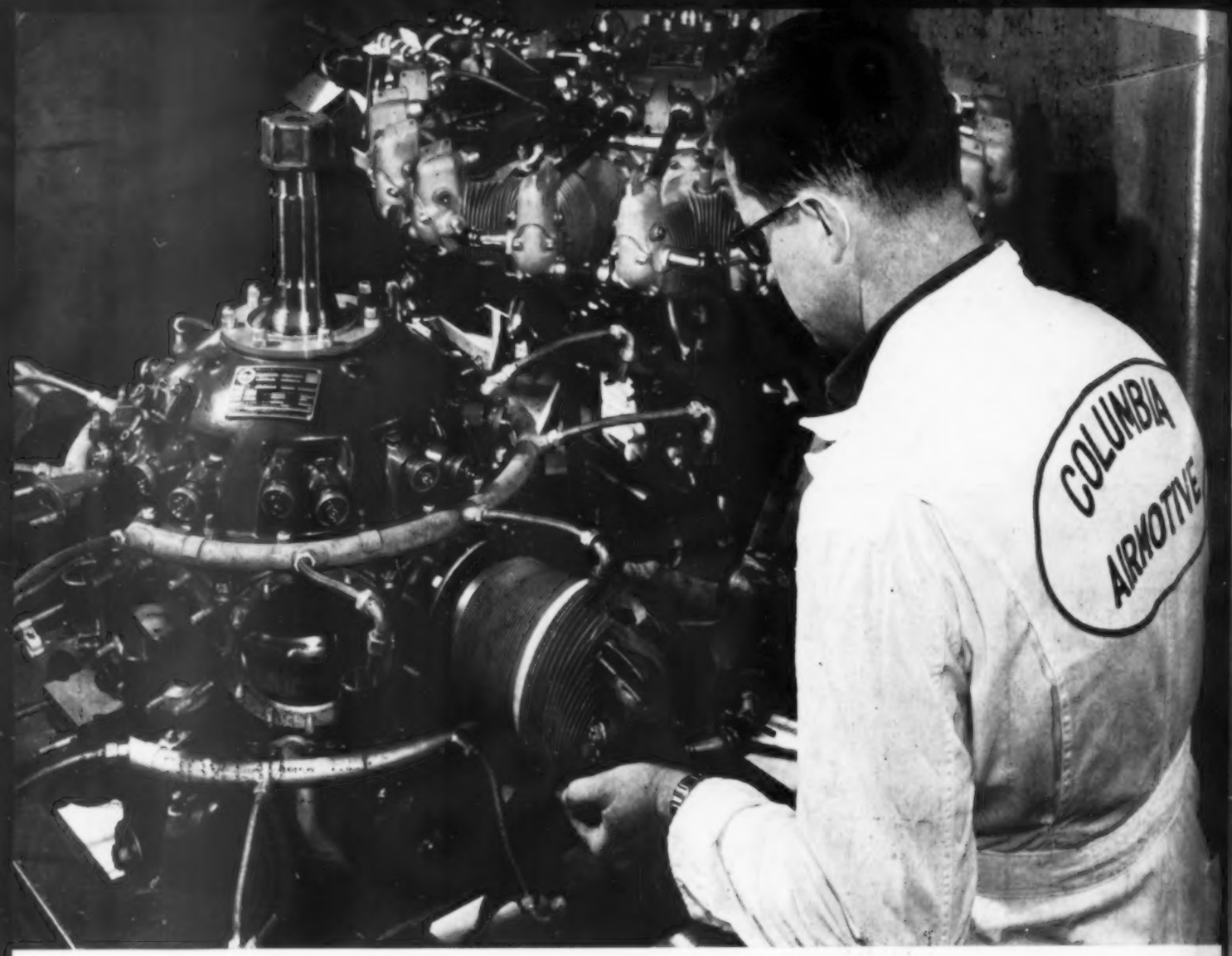

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